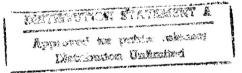
# Water Conservation Study (Water and Energy) Energy Engineering Analysis Program (EEAP) FY94S Fort Knox, Kentucky

Final Report

Volume 1 of 3

CONTRACT #DACA01-94-D-0034 SYSTEMS CORP PROJECT #94013.03 DECEMBER 30, 1994





# DEPARTMENT OF THE ARMY

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#### **SYNOPSIS** 1.1

Systems Corp surveyed and completed water and energy analyses for 650 representative buildings at Fort Knox, categorized as unaccompanied personnel housing, community facilities, administrative facilities, maintenance facilities, training facilities, family housing, post laundry, hospital, heating plants, cooling towers, water treatment plants and water distribution systems. The water and energy conservation opportunities (ECOs) evaluated are listed in Table 1.1.

Cost estimates were prepared using MeansData for Windows Spreadsheets, Version 2.0a. Life cycle cost analyses were performed using the Life Cycle Cost in Design (LCCID) computer program. Project descriptions and DD1391 forms were prepared for four Energy Conservation Investment Program (ECIP) projects. The total of the four projects that were developed represent \$893K in annual savings and a total discounted savings of \$13.4M in the twenty year life of the projects. The simple paybacks average 5.6 years and the savings to investment (SIR) for the four ECIP projects average 2.8. In addition, three Federal Energy Management Program (FEMP) projects were developed. FEMP Project 1 is the replacement of all of the steam traps in the post laundry with a payback of 0.5 years and an SIR of 40. FEMP Project 2 is heating distribution system manhole repairs with a 3.4 year payback and an SIR of 5.5. FEMP Project 3 is the installation of wells to provide irrigation water for Lindsey and Anderson Greens with a 5.1 year payback and an SIR of 2.9.

#### 1.2 INTRODUCTION

Systems Engineering and Management Corporation (Systems/Corp) was contracted by the Louisville District of the United States Army Corps of Engineers in August 1994 to perform a water conservation study of Fort Knox, Kentucky.

# 1.2.1 Scope of Work

- 1. Evaluate selected water and energy conservation opportunities (ECOs) to determine their water and energy savings potential and economic feasibility.
- 2. Conduct a limited site survey of selected buildings, family housing, heating plants, cooling towers and water distribution systems to insure any methods of water conservation which are practical and have not been evaluated in any previous study have been considered and the results documented.

	TABLE 1.1 SUMA	SUMMARY OF RECOMMENDED PROJECTS	COMMEND	ED PROJECT.	5	
	PROJECT	INITIAL COST (\$)	ENERGY SAVINGS (MWH/HR)	SIMPLE PAYBACK PERIOD (YRS)	SIR	WATER AND MAINTENANCE SAVINGS (\$)
ECIP-FH1:	ECIP-FH1: Family Housing Water Conservation Phase	887,700	374	5.73	2.61	106,700
ECIP-FH2:	ECIP-FH2: Family Housing Water Conservation Phase	992,200		5.68	2.61	125,000
ECIP-FH3:	ECIP-FH3: Family Housing Water Conservation Phase 3	980,100		6.63	2.24	006'86
ECIP-4:	Water Conservation Improvements to 452 Non-Family Housing Buildings	1,712,500	3,150	4.12	3.68	296,600
FEMP-1:	Replacement of Steam Traps in Post Laundry	32,900	6,548	0.46	39.92	2,200
FEMP-2:	Heating Distribution System Manhole Repairs	247,200	6,935	3.39	5.48	
FEMP-3:	Golf Course Irrigation Well System	36,900	6-	5.13	2.90	7,603

# 1 EXECUTIVE SUMMARY

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- 3. Determine efficiency of existing systems. Determine the replacement options with the highest SIR.
- 4. Provide complete programming or implementation documentation for all recommended ECOs.
- 5. Prepare a comprehensive report to document the work performed, the results, and the recommendations.

# 1.2.2 Organization of the Final Report

The submitted material for this report consists of the following:

Volume I: Executive Summary, Methods and Approach, ECIP Project 1, ECIP Project 2,

and ECIP Project 3.

Volume II: ECIP Project 4.

Volume III: FEMP Project 1, FEMP Project 2, FEMP Project 3, and Appendices A-D.

## 1.3 PRESENT AND HISTORICAL WATER CONSUMPTION

The baseline water and energy consumption and the water and energy conservation opportunities were evaluated using spreadsheets to calculate water and energy consumption. These have been included in Section 3 through 9 of this report.

The energy, water and sewage treatment costs used to calculate the savings for the project are as follows:

Cost/MBtu							
Electric = \$0	0.02505/KWH or \$25.05/MWH						
Fuel Oil = \$	5.05/MBtu or \$17.15/MWH						
Natural Gas = \$3	.10/MBtu or \$10.51/MWH						
Cost/Kgal							
Water	= \$0.9409/KGAL or \$0.249/Kliter						
Sewage	= \$0.6292KGAL or \$0.160/Kliter						

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## 1.4 ENERGY CONSERVATION OPPORTUNITIES INVESTIGATED

Systems Corp analyzed sixteen water and energy conservation opportunities (ECOs) at Fort Knox, Kentucky. The analysis was performed utilizing water and energy models developed by Systems Corp and data collected during the field survey of the facilities at Fort Knox. Each ECO was evaluated to determine the potential water and energy savings, dollar savings, implementation costs, simple payback, life cycle cost, and savings to investment ratio (SIR). The sixteen ECOs that were evaluated are as follows:

ECO-1	Spring-Loaded Faucets
ECO-2	Faucet Aerators
ECO-2FH	Faucet Aerators in Family Housing Units
ECO-3	Flush Valves for Water Closets
ECO-3FH	Water Closets in Family Housing Units
ECO-4	Flush Valve Retrofits for Urinals
ECO-5	Water Saving Showerheads
ECO-6	Dining Facility (Kitchen) Retrofits
ECO-7	Golf Course Irrigation
ECO-8	Post Laundry Retrofits
ECO-9	Water Treatment Plants and Well Field Motors and Pumps
ECO-10	Manhole Sump Pump Repairs
ECO-11	Sensor Controls
ECO-12	Water Heater Insulation Blanket
ECO-16	Ozone Treatment of Cooling Tower Water

Systems Corp's water and energy analysis models were used to determine the savings achieved for implementing each ECO in the facilities evaluated. MeansData for Windows Spreadsheets, Version 2.0a cost estimating software was used to estimate the implementation cost of each ECO in each facility evaluated. The U.S. Army Corps of Engineers' Life Cycle Cost in Design, Version 1.0, Level 92, software was used to perform life cycle cost analyses and determine the SIR of each ECO for each facility evaluated.

# 1.4.1 ECOs Recommended

Systems Corp recommended both ECOs evaluated be implemented, but not in every area surveyed. The following is a list of the ECOs recommended to be implemented by area surveyed. The criteria for recommendation is a favorable simple payback, and savings to investment ratio (SIR).

ECO-1	Spring-Loaded Faucets
ECO-2	Faucet Aerators
ECO-2FH	Faucet Aerators in Family Housing Units
ECO-3	Flush Valves for Water Closets
ECO-3FH	Water Closets in Family Housing Units
ECO-4	Flush Valve Retrofits for Urinals
ECO-6	Dining Facility (Kitchen) Retrofits
ECO-7	Golf Course Irrigation
ECO-8	Post Laundry Retrofits
ECO-10	Manhole Sump Pump Repairs
1 4 2	FCOs Rejected

1.4.2 ECOs Rejected

ECO-9, 11, 12, and 16 were rejected due to the large investment required, the low potential savings, or the existence of a more economically feasible technology. Refer to Appendix D for The Life Cycle Cost Analyses, Cost Estimates and Calculations.

# 1.4.3 ECIP and FEMP Projects Developed

Systems Corp developed four ECIP projects and three FEMP projects (see Table 1.4.3). ECIP Family Housing Project 1 consists of the replacement of water closets in 1354 family housing units with water saving, 6-liters (1.6 gallons)-per-flush water closets, and the installation of faucet aerators in 328 family housing units. ECIP Family Housing Project 2 consists of the replacement of water closets in 1602 family housing units with water saving, 6-liters (1.6 gallons)-per-flush water closets. ECIP Family Housing Project 3 consists of the replacement of water closets in 1268 family housing units with water saving, 6-liters (1.6 gallons)-per-flush water closets. ECIP Project 4 consists of the replacement of flush valves and faucets in 452 buildings with water saving flush valves, metering valve faucets and the installation of faucet aerators. FEMP Project 1 consists of the replacement of all of the steam traps in Building 18, the Post Laundry. FEMP Project 2 consists of the repairs to the heating distribution system manholes for the underground distribution systems serving boiler plants in the following buildings: Buildings 852, 1537, 1725, 1731, 1785, 1797, 2780, 5213, 5943,

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6615 and 7203. FEMP Project 3 consists of disconnecting the existing potable water supplies and drilling two wells, one each for the Lindsey and Anderson golf courses.

This section of the report describes the method and approach used by Systems Corp to complete the study. Of primary importance to the successful completion of a project of this magnitude is organization, planning and the ability to quickly document, evaluate and manipulate large amounts of data. This data must then be reduced to useable form which allows for full development of the various projects within the available funding categories. Four Energy Conservation Investment Program (ECIP) projects and three Federal Energy Management Program (FEMP) projects were developed.

## 2.1 FIELD SURVEY

The field survey as performed by Systems Corp was designed to provide the necessary data required to complete the Scope of Work for this project. It was also designed to provide residual benefits to the installation by providing an organized and readily available source of information which can be used in future years. The information was transmitted in the form of field notes using standardized survey forms.

The survey forms were designed to allow notations of all data which could be utilized (not necessarily required) to calculate the energy savings gained by implementing a specific energy conservation opportunity. These forms contain data obtained from as-built drawings and old energy studies confirmed in the fields as well as data obtained only in the field.

Thorough preparation for the building survey is required to ensure the data required to perform the technical analysis is obtained. The building surveys were performed in a manner which assured the best results. A simple listing of each step of the process best describes our approach to the surveys.

- 1. The list of Water and Energy Conservation Opportunities (ECOs) included in the work scope were reviewed in detail.
- 2. Each ECO was given an identification number which is used consistently throughout this project.
- 3. An expanded description of each ECO was formulated to outline the possible methods for implementation of the ECO.
- 4. Survey forms were developed for each ECO to provide space to enter any data which might possibly be used in performing the engineering and economic analysis of the ECO.
- 5. The building surveys were performed. Measurements of existing flow rates were made.
- 6. The Systems Corp survey team met with the post Energy Officer throughout the survey on an as-needed basis.

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FY94S WATER CONSERVATION STUDY (WATER AND ENERGY), FT. KNOX, KY

# 2.1.1 Energy and Water Conservation Opportunities

The Systems Corp's Water and Energy Conservation Team gathered field data and evaluated 18 distinct energy conservation opportunities. The energy conservation opportunities are listed following table:

TA	BLE 2.1.1 Energy/Water Conservation Opportunities
ECO - 1	Spring Loaded Faucets
ECO - 2	Faucet Aerators
ECO - 2FH	Faucet Aerators
ECO - 3	Flush Valve Replacements for Water Closets
ECO - 3FH	Water Closet Replacement
ECO - 4	Flush Valve Replacements for Urinals
ECO - 5	Water Saving Showerheads
ECO - 6	Dining Facilities Kitchen Areas
ECO - 7	Golf Course Irrigation
ECO - 8	Post Laundry
ECO - 9	Waste Treatment Plants and Well Fields, Motors, and Pumps
ECO - 10	Manhole Sump Pump Repairs
ECO - 11	Sensor Controls for Faucets
ECO - 12	Water Heater Insulation Blankets
ECO - 13	Distribution Waterline Motors, Valves, Leaks, Storage Towers and
	Tanks, Off Peak, and Capacities
ECO - 14	Hospital, Process Cooling, i.e. X-ray and CAT scan Equipment, and
	Leaks
ECO - 15	Vehicle Wash Facilities
ECO - 16	Cooling Towers at Hospital

# 2.1.2 Energy and Water Conservation Opportunities That Were Not Evaluated

Systems Corp's Water and Energy Conservation Team surveyed all facilities before any determination of the applicability of the energy conservation opportunity was made. After completing the field survey, ECO-13, ECO-14, ECO-15 and ECO-16 were discarded.

# 2.1.2.1 ECO-5 Water Saving Showerheads

During the field survey, it was determined that water saving 2.5 gpm showerheads were already in place. The ECO was discarded.

# 2.1.2.2 ECO-13 Distribution Waterlines, Motors, Valves, Leaks, Storage Towers and Tanks, Off Peak and Capacities

All pump motors were evaluated under ECO-9. No distribution leaks were discovered during the survey. In addition, Fort Knox Directorate of Public Works, Operation and Maintenance Personnel were interviewed to learn of any likely areas where distribution water lines were suspect. The new water storage tank project plans and specifications were reviewed. The post's electrical demand profile and water treatment plant recorder charts were reviewed to determine the impact of water pumps on electric demand charges. Comparison of the data showed that peak water demand did not coincide with peak electrical demand periods. The ECO was discarded after completing these review steps.

# 2.1.2.3 ECO-14 Hospital Process Cooling

ECO-14 Hospital Process Cooling pertained to the use of potable water to perform cooling of X-ray, CAT scan, dialysis or medical equipment and any associated leaks. An extensive survey of Ireland Army Community Hospital was completed with excellent cooperation and assistance from the Hospital staff. No instances were found where potable water was being used to perform process cooling. Since no water saving opportunities relating to process cooling or any associated leaks were found, ECO-14 was eliminated.

### 2.1.2.4 ECO-15 Vehicle Wash Facilities

ECO-15 Vehicle Wash Facilities pertained to water saving opportunities relating to vehicle washing systems. The vehicle wash facilities are located adjacent to Building 7233 and at the intersection of Wilson Road and Frazier Road. The wash systems were found to be using rain water only which is

# 2 METHODS AND APPROACH

# FY94S WATER CONSERVATION STUDY (WATER AND ENERGY), FT. KNOX, KY

recycled after each use. No water conservation opportunities were found, and ECO-15 was eliminated.

# 2.1.3 Buildings Not Evaluated

The scope of work delineates which energy conservation opportunities are to be evaluated for buildings in each category code. A real property list, sorted by category code, was appended to the scope of work. The following tables list the buildings included in the real property list for which no energy conservation opportunities were evaluated. The title of each table describes the reason that no energy conservation opportunities were evaluated for the buildings in each list.

Table 2.1.3.1 is a listing of all of the buildings that were included in the real property listing, sorted by category codes, that do not have water service.

Table 2.1.3.2 is a listing of all of the buildings that were included in the real property listing, sorted by category codes, that are abandoned or not occupied.

Table 2.1.3.3 is a listing of all of the buildings that were included in the real property listing, sorted by category codes, that no longer exist.

Table 2.1.3.4 is a listing of all the buildings that were included in the real property listing, sorted by category codes, that are not located at Fort Knox.

Table 2.1.3.5 is a listing of all the buildings that were included in the real property listing, sorted by category codes, and are non-appropriated fund facilities (AAFES).

Refer to the following tables:

- Table 2.1.3.1 Buildings Without Water No ECOs Evaluated
- Table 2.1.3.2 Buildings Abandoned or Not Occupied No ECOs Evaluated
- Table 2.1.3.3 Buildings That No Longer Exist No ECOs Evaluated
- Table 2.1.3.4 Buildings That Are Not Located at Fort Knox No ECOs Evaluated
- Table 2.1.3.5 Non-Appropriated Fund Facilities No ECOs Evaluated

TABLE 2.1.3.1 BUILDINGS WITHOUT WATER - NO ECOS EVALUATED

CATEGORY		CATEGORY/DESCRIPTION	AREA (SQ FT)	YEAR
17120	01526	GEN INST BLDG	4078	1958
17120	06286	GEN INST BLDG	1496	1987
17120	06287	GEN INST BLDG	1496	1987
17120	06288	GEN INST BLDG	1496	1987
17120	09332	GEN INST BLDG	1000	1962
17120	09349	GEN INST BLDG	1000	1962
17120	09460	GEN INST BLDG	597	1960
17120	09474	GEN INST BLDG	992	1962
17120	09509	GEN INST BLDG	144	1985
17120	09643	GEN INST BLDG	1038	1977
17120	09745	GEN INST BLDG	578	1986
17120	09746	GEN INST BLDG	578	1986
17120	09747	GEN INST BLDG	578	1985
17120	09748	GEN INST BLDG	578	1986
17120	09749	GEN INST BLDG	578	1986
17120	09760	GEN INST BLDG	800	1988
17120	09761	GEN INST BLDG	800	1988
17122	06035	RG HOUSE	2830	1988
17122	09346	RG HOUSE	180	1965
17122	09355	'RG HOUSE	160	1982
17122	09381	RG HOUSE	75	1987
17122	09382	RG HOUSE	54	1987
17122	09712	RG HOUSE	558	1983
17122	09713	RG HOUSE	558	1983
17122	09715	RG HOUSE	558	1983
17122	09716	RG HOUSE	558	1983
17122	09717	RG HOUSE	366	1983
17122	09718	RG HOUSE	366	1983
17122	09719	RG HOUSE	366	1983
17122	09720	RG HOUSE	366	1983
17122	09722	RG HOUSE	558	1983
17122	09723	RG HOUSE	558	1983
17123	09219	RANGE SPT BLDG	800	1960
17123	09340	RANGE SPT BLDG	1800	1965
17123	09344	RANGE SPT BLDG	1800	1965
17123	09376	RANGE SPT BLDG	108	1985
17123	09377	RANGE SPT BLDG	108	1985
17123	09379	RANGE SPT BLDG	54	1985
17123	09380	RANGE SPT BLDG	108	1985
17123	09384	RANGE SPT BLDG	2165	1987
17123	09463	RANGE SPT BLDG	3200	1970
17123	09609	RANGE SPT BLDG	69	1977
17123	09755	RANGE SPT BLDG	120	1988
17123	09763	RANGE SPT BLDG	120	1988
17130	09175	APPL INST BLDG	800	1983
17139	02387	COVD TRNG AREA	200	1977
17139	02792	COVD TRNG AREA	320	1976
17139	06915	COVD TRNG AREA	1056	1983

TABLE 2.1.3.1 BUILDINGS WITHOUT WATER - NO ECOS EVALUATED

CATEGORY		CATEGORY/DESCRIPTION	AREA (SQ FT)	YEAR
17139	09399	COVD TRNG AREA	613	1984
17139	09462	COVD TRNG AREA	1212	1980
17139	09602	COVD TRNG AREA	840	1977
17139	09610	COVD TRNG AREA	803	1977
17139	09620	COVD TRNG AREA	3648	1977
17139	09623	COVD TRNG AREA	757	1977
17139	09625	COVD TRNG AREA	392	1977
17139	09627	COVD TRNG AREA	757	1977
17139	09631	COVD TRNG AREA	776	1977
17139	09633	COVD TRNG AREA	776	1977
17139	09634	COVD TRNG AREA	840	1977
17139	09637	COVD TRNG AREA	845	1977
17139	09646	COVD TRNG AREA	650	1977
17139	09647	COVD TRNG AREA	€50	1977
17139	09665	COVD TRNG AREA	780	1977
17139	09673	COVD TRNG AREA	574	1977
17139	09759	COVD TRNG AREA	984	1988
17139	09762	COVD TRNG AREA	984	1988
17139	09780	COVD TRNG AREA	992	1988
17139	09781	COVD TRNG AREA	992	1988
17139	09782	COVD TRNG AREA	992	1988
17139	09786	COVD TRNG AREA	992	1988
17170	07106	GAS CHAMBER	1392	1969
17190	09292	OTHER	144	1970
17190	09459	OTHER	64	1970
17190	09502	OTHER	256	1987
17190	09600	OTHER	18	1977
17190	09601	OTHER	69	1977
17190	09603	OTHER	69	1977
17190	09604	OTHER	69	1977
17190	09605	OTHER	69	1977
17190	09607	OTHER	69	1977
17190	09608	OTHER	67	1977
17190	09611	OTHER	69	1977
17190	09612	OTHER	69	1977
17190	09613	OTHER	81	1977
17190	09615	OTHER	81	1977
17190	09616	OTHER	26	1977
17190	09622	OTHER	69	1977
17190	09624	OTHER	69	1977
17190	09626	OTHER	69	1977
17190	09628	OTHER	128	1983
17190	09630	OTHER	69	1977
17190	09632	OTHER	69	1977
17190	09635	OTHER	69	1977
17190	09636	OTHER	69	1977
17190	09638	OTHER	72	1977
17190	09644	OTHER	39	1977

TABLE 2.1.3.1 BUILDINGS WITHOUT WATER - NO ECOS EVALUATED

CATEGORY		CATEGORY/DESCRIPTION	AREA (SQ FT)	YEAR
17190	09645	OTHER	54	1977
17190	09649	OTHER	36	1977
17190	09652	OTHER	26	1977
17190	09653	OTHER	26	1977
17190	09654	OTHER	26	1977
17190	09656	OTHER	64	1977
17190	09659	OTHER	64	1977
17190	09663	OTHER	64	1977
17190	09664	OTHER	49	1977
17190	09670	OTHER	35	1977
17190	09707	OTHER	88	1983
17190	09708	OTHER	558	1983
17190	09709	OTHER	558	1983
17190	09711	OTHER	88	1983
17190	09714	OTHER	88	1983
17190	09721	OTHER	88	1983
17190	09752	OTHER	32	1988
17190	09756	OTHER	114	1983
17190	09766	OTHER	114	1983
17190	09787	OTHER	72	1988
17190	09788	OTHER	72	1988
21420	07339	VEH MNT SH DS	2000	1962
21459	02738	OC&L FAC COV	2000	1989
21459	02739	OC&L FAC COV		1989
21470	02753	OIL STO BLDG	120	1964
21470	02773	OIL STO BLDG	120	1964
21470	02776	OIL STO BLDG	120	1964
21470	02777	OIL STO BLDG	120	1964
21470	02779	OIL STO BLDG	120	1964
21470	02784	OIL STO BLDG	120	1964
21470	02791	OIL STO BLDG	120	1969
21470	02965	OIL STO BLDG	120	1969
21470	02966	OIL STO BLDG	120	1969
21470	06124	OIL STO BLDG	120	1965
21470	06594	OIL STO BLDG	120	1968
21470	06596	OIL STO BLDG	120	1968
72321	02990	DET LATRINE BDG	70	1966
72321	04124	DET LATRINE BDG	138	1964
		DET LATRINE BDG		
72321	06528	DET LATRINE BDG	150 178	1987
72321	07237		178	1987 1979
72321	09185	DET LATRINE BDG DET LATRINE BDG	72 179	
72321	09204		178	1960
72321	09205	DET LATRINE BDG	178	1960
72321	09208	DET LATRINE BDG	178	1961
72321	09224	DET LATRINE BDG	178	1964
72321	09231	DET LATRINE BDG	178	1960
72321	09232	DET LATRINE BDG	178	1960
72321	09233	DET LATRINE BDG	178	1960

TABLE 2.1.3.1 BUILDINGS WITHOUT WATER - NO ECOS EVALUATED

CATEGORY		CATEGORY/DESCRIPTION	AREA (SQ FT)	YEAR
72321	09234	DET LATRINE BDG	178	1961
72321	09235	DET LATRINE BDG	178	1961
72321	09236	DET LATRINE BDG	178	1961
72321	09237	DET LATRINE BDG	167	1966
72321	09239	DET LATRINE BDG	178	1961
72321	09240	DET LATRINE BDG	178	1961
72321	09241	DET LATRINE BDG	178	1961
72321	09242	DET LATRINE BDG	178	1961
72321	09254	DET LATRINE BDG	178	1963
72321	09256	DET LATRINE BDG	178	1963
72321	09258	DET LATRINE BDG	178	1963
72321	09264	DET LATRINE BDG	179	1972
72321	09265	DET LATRINE BDG	178	1961
72321	09270	DET LATRINE BDG	178	1961
72321	09273	DET LATRINE BDG	178	1961
72321	09274	DET LATRINE BDG	178	1961
72321	09275	DET LATRINE BDG	178	1962
72321	09276	DET LATRINE BDG	178	1961
72321	09282	DET LATRINE BDG	178	1961
72321	09284	DET LATRINE BDG	178	1961
72321	09286	DET LATRINE BDG	178	1961
72321	09290	DET LATRINE BDG	178	1961
72321	09302	DET LATRINE BDG	178	1963
72321	09305	DET LATRINE BDG	. 16	1972
72321	09315	DET LATRINE BDG	178	1966
72321	09316	DET LATRINE BDG	178	1963
72321	09317	DET LATRINE BDG	178	1963
72321	09318	DET LATRINE BDG	178	1963
72321	09322	DET LATRINE BDG	178	1963
72321	09323	DET LATRINE BDG	16	1972
72321	09324	DET LATRINE BDG	16	1972
72321	09325	DET LATRINE BDG	178	1963
72321	09328	DET LATRINE BDG	16	1972
72321	09330	DET LATRINE BDG	178	1963
72321	09335	DET LATRINE BDG	178	1966
72321	09342	DET LATRINE BDG	178	1965
72321	09347	DET LATRINE BDG	171	1966
72321	09350	DET LATRINE BDG	178	1969
72321	09351	DET LATRINE BDG	178	1969
72321	09352	DET LATRINE BDG	178	1969
72321	09353	DET LATRINE BDG	178	1969
72321	09358	DET LATRINE BDG	180	1964
72321	09360	DET LATRINE BDG	178	1964
72321	09361	DET LATRINE BDG	16	1978
72321	09362	DET LATRINE BDG	16	1978
72321	09363	DET LATRINE BDG	16	1978
72321	09364	DET LATRINE BDG	16	1978
72321	09365	DET LATRINE BDG	16	1978

TABLE 2.1.3.1 BUILDINGS WITHOUT WATER - NO ECOS EVALUATED

CATEGORY		CATEGORY/DESCRIPTION	AREA (SQ FT)	YEAR
72321	09366	DET LATRINE BDG	16	1978
72321	09367	DET LATRINE BDG	16	1978
72321	09395	<b>DET LATRINE BDG</b>	178	1967
72321	09396	DET SHOWER BLDG	920	1987
72321	09467	DET LATRINE BDG	192	1970
72321	09471	DET LATRINE BDG	192	1970
72321	09472	DET LATRINE BDG	192	1970
72321	09475	DET LATRINE BDG	178	1970
72321	09476	<b>DET LATRINE BDG</b>	178	1970
72321	09477	DET LATRINE BDG	178	1970
72321	09479	DET LATRINE BDG	179	1979
72321	09606	DET LATRINE BDG	168	1977
72321	09619	DET LATRINE BDG	168	1977
72321	09621	DET LATRINE BDG	177	1977
72321	09660	DET LATRINE BDG	187	1977
72321	09661	DET LATRINE BDG	187	1977
72321	09671	DET LATRINE BDG	264	1977
72321	09674	DET LATRINE BDG	179	1985
72321	09675	DET LATRINE BDG	220	1979
72321	09676	DET LATRINE BDG	220	1979
72321	09677	DET LATRINE BDG	220	1979
72321	09678	DET LATRINE BDG	220	1979
72321	09679	DET LATRINE BDG	220	1979
72321	09680	DET LATRINE BDG	220	1979
72321	09681	DET LATRINE BDG	220	1979
72321	09682	DET LATRINE BDG	220	1979
72321	09683	DET LATRINE BDG	220	1979
72321	09684	DET LATRINE BDG	220	1979
72321	09685	DET LATRINE BDG	220	1979
72321	09686	DET LATRINE BDG	220	1979
72321	09687	DET LATRINE BDG	220	1979
72321	09688	DET LATRINE BDG	220	1979
72321	09689	DET LATRINE BDG	220	1979
72321	09690	DET LATRINE BDG	220	1979
72321	09691	DET LATRINE BDG	220	1979
72321	09692	DET LATRINE BDG	220	1979
72321	09693	DET LATRINE BDG	220	1979
72321	09694	DET LATRINE BDG	220	1979
72321	09695	DET LATRINE BDG	220	1979
72321	09696	DET LATRINE BDG	220	1979
72321	09697	DET LATRINE BDG	220	1979
72321	09698	DET LATRINE BDG	220	1979
72321	09699	DET LATRINE BDG	220	1979
72321	09700	DET LATRINE BDG	220	1979
72321	09701	DET LATRINE BDG	220	1979
72321	09702	DET LATRINE BDG	220	1979
72321	09703	DET LATRINE BDG	220	1979
72321	09704	DET LATRINE BDG	220	1979

TABLE 2.1.3.1 BUILDINGS WITHOUT WATER - NO ECOS EVALUATED

CATEGORY		CATEGORY/DESCRIPTION	AREA (SQ FT)	YEAR
72321	09705	DET LATRINE BDG	133	1983
72321	09706	DET LATRINE BDG	133	1983
72321	09751	DET LATRINE BDG	180	1988
72321	09757	DET LATRINE BDG	199	1988
72321	09758	DET LATRINE BDG	199	1988
72321	09764	DET LATRINE BDG	199	1988
72321	09765	DET LATRINE BDG	199	1988
72350	00858	DETACH GARAGES	780	1980
72350	01008	DETACH GARAGES	2131	1941
73055	00128	WAITING SHELTER	62	1981
73055	01305	WAITING SHELTER	62	1981
73055	01381	WAITING SHELTER	62	1981
73055	01502	WAITING SHELTER	62	1981
73055	02440	WAITING SHELTER	62	1981
73055	02652	WAITING SHELTER	62	1981
73055	02813	WAITING SHELTER	60	1963
73055	04025	WAITING SHELTER	362	1936
73055	04112	WAITING SHELTER	120	1956
73055	04120	WAITING SHELTER	120	1956
73055	04122	WAITING SHELTER	120	1956
73055	04123	WAITING SHELTER	144	1970
73055	04125	WAITING SHELTER	120	1966
73055	04126	WAITING SHELTER	120	1966
73055	05914	WAITING SHELTER	62	1981
73055	05945	WAITING SHELTER	62	1981
73055	06651	WAITING SHELTER	62	1981
73055	06757	WAITING SHELTER	62	1981
73055	06766	WAITING SHELTER	180	1960
73055	07343	WAITING SHELTER	60	1963
73055	07950	WAITING SHELTER	137	1966
73055	07951	WAITING SHELTER	137	1966
73055	07952	WAITING SHELTER	137	1966
73055	09182	WAITING SHELTER	72	1980
73055	09249	WAITING SHELTER	192	1963
73055	09503	WAITING SHELTER	48	1985
73055	09504	WAITING SHELTER	48	1985
73055	09505	WAITING SHELTER	48	1985
73055	09506	WAITING SHELTER	48	1985
73055	09507	WAITING SHELTER	48	1985
73055	09508	WAITING SHELTER	48	1985
73072	04770	PO BRANCH	859	1958
73075	07725	PUBLIC TOILET	312	1972
73090	07725	OTHER	0	1989
74025	01171	ACES FACILITY	4460	1973
74025 74025	01171	ACES FACILITY	4460 4460	1973
74025 74031	04011	GOLF COURSE MNT	3800	1985
		GOLF COURSE MNT	664	
74031	09021	RIDING STABLE		1941
74049	07718	KIDING STABLE	2558	1941

TABLE 2.1.3.1 BUILDINGS WITHOUT WATER - NO ECOS EVALUATED

CATEGORY	***	CATEGORY/DESCRIPTION	AREA (SQ FT)	YEAR
74049	07719	RIDING STABLE	3204	1918
74049	07724	RIDING STABLE	2558	1940
74049	07726	RIDING STABLE	2555	1938
74049	07727	RIDING STABLE	2510	1938
74049	09022	RIDING STABLE	5168	1941
74062	04128	SNACK BAR	144	1979
74069	00542	RECREATION BLDG	1144	1941
74069	00544	RECREATION BLDG	1144	1941
74069	00546	RECREATION BLDG	1144	1941
74069	09191	RECREATION BLDG	569	1972
74069	09192	RECREATION BLDG	569	1972
74069	09193	RECREATION BLDG	569	1972
74069	09194	RECREATION BLDG	569	1972
74069	09195	RECREATION BLDG	569	1969
74069	09196	RECREATION BLDG	569	1969
74069	09197	RECREATION BLDG	628	1969
74069	09198	RECREATION BLDG	569	1969
74069	09199	RECREATION BLDG	3018	1969
74090	07713	OTHER	72	1988
82116	00601	HEAT PL BLDG	405	1941
82116	07033	HEAT PL BLDG	359	1941
82150	07203	STEAM PL POWER	13674	1986
84150	09187	CHLORINATOR BLDG	48	1972
84220	09213	WATER PUMP P		1942

TABLE 2.1.3.2 BUILDINGS ABANDONED OR NOT OCCUPIED NO ECOS EVALUATED

CATEGORY	BLDG	CATEGORY/DESCRIPTION	AREA (SQ FT)	YEAR
17120	00265	GEN INST BLDG	3158	1941
17120	01011	GEN INST BLDG	1843	1941
17120	01501	GEN INST BLDG	3871	1943
17120	01526	GEN INST BLDG	4078	1958
17120	06682	GEN INST BLDG	2892	1941
17150	06763	BN CLASSROOMS	3547	1953
21410	00160	VEH MNT SH ORG	3427	1942
21420	00578	VEH MNT SH DS	2728	1942
21420	00579	VEH MNT SH DS	2728	1942
21420	00584	VEH MNT SH DS	8208	1943
21420	07330	VEH MNT SH DS	4687	1942
21420	07331	VEH MNT SH DS	4687	1942
21420	07340	VEH MNT SH DS	4687	1942
17120	00580	VEH MNT SH DS	2728	1942
17120	07341	VEH MNT SH DS	3560	1942
17120	07423	VEH MNT SH DS	4687	1942
72114	00703	ENL BKS AN TR	4720	1941
72114	00704	ENL BKS AN TR	4720	1941
72114	00705	ENL BKS AN TR	4720	1941
72114	00801	ENL BKS AN TR	4720	1941
72114	00802	ENL BKS AN TR	4720	1941
72114	00804	ENL BKS AN TR	4720	1941
72114	00809	ENL BKS AN TR	4720	1941
72114	00811	ENL BKS AN TR	4720	1941
72114	00812	ENL BKS AN TR	4720	1941
72114	00816	ENL BKS AN TR	4720	1941
72114	00817	ENL BKS AN TR	4720	1941
72114	00819	ENL BKS AN TR	4720	1941
72114	00824	ENL BKS AN TR	4720	1941
72114	00824	ENL BKS AN TR	4720	1941
72114	00827	ENL BKS AN TR	4883	1941
72114	00831	ENL BKS AN TR	4720	1941
72114	00836	ENL BKS AN TR	4720	1941
	00839	ENL BKS AN TR	4720	1941
72114		ENL BKS AN TR	4720	1941
72114	07385 07388	ENL BKS AN TR	4720	1941
72114 72114	07391	ENL BKS AN TR	4720	1941
				1985
72114	07396	ENL BKS AN TR	4720 2500	1942
72210	07386	EN PERS DINE		1942
72220	02442	OFF FR DINE FAC	10977	1962
17123	06677	DET DAY ROOM	2892	
17123	06678	DET DAY ROOM	1200	1941
73018	00887	RELG EDUC FAC	1200	1973
73019	00888	UNIT CHAPEL	3765	1942
73025	02321	PASTRY KITCHEN	7733	1938
74025	01023	ACES FACILITY	1296	1941
74027	06645	OPEN DIN NCO	9525	1943
74027	07375	DRAMA CENTER	22746	1940

TABLE 2.1.3.2 BUILDINGS ABANDONED OR NOT OCCUPIED NO ECOS EVALUATED

CATEGORY	BLDG	CATEGORY/DESCRIPTION	AREA (SQ FT)	YEAR
74066	01338	YOUTH CENTER	8611	1930
74069	00820	RECREATION BLDG	1144	1941
74069	00822	RECREATION BLDG	1144	1941
74069	00833	RECREATION BLDG	1144	1941
74069	05020	RECREATION BLDG	4569	1943
74069	06626	RECREATION BLDG	4320	1942

TABLE 2.1.3.3 BUILDINGS THAT NO LONGER EXIST NO ECOS EVALUATED

CATEGORY	BLDG	CATEGORY_DESCR	AREA (SQ FT)	YEAR
17120	00224	GEN INST BLDG	1676	1942
17120	00727	GEN INST BLDG	2360	1941
17120	02710	GEN INST BLDG	3246	1941
17120	02713	GEN INST BLDG	3246	1941
17120	02718	GEN INST BLDG	4720	1941
17120	02719	GEN INST BLDG	4720	1941
17120	07311	GEN INST BLDG	3108	1942
17130	00707	APPL INST BLDG	3380	1941
17130	00745	APPL INST BLDG	3548	1953
17130	00746	APPL INST BLDG	3548	1953
21410	00159	VEH MNT SH ORG	20833	1942
21920	04066	FE FACILITY	2250	1942
72114	00570	ENL BKS AN TR	4720	1941
72114	00617	ENL BKS AN TR	4720	1942
72114	00620	ENL BKS AN TR	4720	1942
72114	00621	ENL BKS AN TR	4720	1941
72114	00622	ENL BKS AN TR	4720	1941
72114	00624	ENL BKS AN TR	4720	1941
72114	00625	ENL BKS AN TR	4720	1941
72114	00626	ENL BKS AN TR	4720	1941
72114	00627	ENL BKS AN TR	4720	1941
72114	00628	ENL BKS AN TR	4720	1941
72114	00630	ENL BKS AN TR	4720	1941
72114	00645	ENL BKS AN TR	4720	1941
72114	00646	ENL BKS AN TR	4720	1941
72114	00647	ENL BKS AN TR	4720	1941
72114	00648	ENL BKS AN TR	4720	1941
72114	00649	ENL BKS AN TR	4720	1941
72114	00650	ENL BKS AN TR	4720	1941
72114	00651	ENL BKS AN TR	4720	1941
72114	00652	ENL BKS AN TR	4720	1941
72114	00659	ENL BKS AN TR	4720	1941
72114	00660	ENL BKS AN TR	4720	1941
72114	00661	ENL BKS AN TR	4720	1941
72114	00665	ENL BKS AN TR	4720	1941
72114	00666	ENL BKS AN TR	4720	1941
72114	00667	ENL BKS AN TR	4720	1941
72114	00668	ENL BKS AN TR	4720	1941
		ENL BKS AN TR		
72114	00669	ENL BKS AN TR	4720 4720	1941 1941
72114	00683	ENL BKS AN TR	4720	1941
72114	00685		4720	1941
72114	00686	ENL BKS AN TR		
72114	00687	ENL BKS AN TR	4720	1941
72114	00688	ENL BKS AN TR	4720	1941
72114	00717	ENL BKS AN TR	4720	1941
72114	00726	ENL BKS AN TR	4720	1941
72114	00728	ENL BKS AN TR	4720	1941
72114	00729	ENL BKS AN TR	4720	1941
72114	00729	ENL BKS AN TR	4720	1941

TABLE 2.1.3.3 BUILDINGS THAT NO LONGER EXIST NO ECOS EVALUATED

CATEGORY	BLDG	CATEGORY_DESCR	AREA (SQ FT)	YEAR
72114	02705	ENL BKS AN TR	4720	1941
72114	02706	ENL BKS AN TR	4720	1941
72114	02707	ENL BKS AN TR	4720	1941
72114	02709	ENL BKS AN TR	4720	1941
72114	02832	ENL BKS AN TR	4720	1941
72114	02844	ENL BKS AN TR	4720	1941
72114	02847	ENL BKS AN TR	4720	1941
72114	02850	ENL BKS AN TR	4720	1941
72114	02853	ENL BKS AN TR	4720	1941
72114	02855	ENL BKS AN TR	4720	1941
72114	02858	ENL BKS AN TR	4720	1941
72114	02859	ENL BKS AN TR	4720	1941
72114	02861	ENL BKS AN TR	4720	1941
72114	02864	ENL BKS AN TR	4720	1941
72114	02865	ENL BKS AN TR	4720	1941
72114	02866	ENL BKS AN TR	4720	1941
72114	02870	ENL BKS AN TR	4720	1941
72114	02871	ENL BKS AN TR	4720	1941
72114	02874	ENL BKS AN TR	4720	1941
72114	02875	ENL BKS AN TR	4720	1941
72114	02878	ENL BKS AN TR	4720	1941
72114	02879	ENL BKS AN TR	4720	1941
72114	02882	ENL BKS AN TR	4720	1941
72114	02883	ENL BKS AN TR	4720	1941
72114	02886	ENL BKS AN TR	4720	1941
72114	02887	ENL BKS AN TR	4720	1941
72114	02890	ENL BKS AN TR	4720	1941
72114	02891	ENL BKS AN TR	4720	1941
72114	02893	ENL BKS AN TR	4720	1941
72114	02894	ENL BKS AN TR	4720	1941
72114	02903	ENL BKS AN TR	4720	1941
72114	02904	ENL BKS AN TR	4720	1941
72114	02905	ENL BKS AN TR	4720	1941
72114	02915	ENL BKS AN TR	4720	1941
72114	02916	ENL BKS AN TR	4720	1941
72114	02922	ENL BKS AN TR	4720	1941
72114	02923	ENL BKS AN TR	4720	1941
72114	02929	ENL BKS AN TR	4720	1941
72114	02945	ENL BKS AN TR	4720	1941
72114	04067	ENL BKS AN TR	4720	1941
72114	05001	ENL BKS AN TR	4720	1941
72114	05002	ENL BKS AN TR	4720	1941
72114	05004	ENL BKS AN TR	4720	1941
72114	07303	ENL BKS AN TR	4720	1941
72114	07304	ENL BKS AN TR	4720	1941
72114	07305	ENL BKS AN TR	4720	1941
72114	07306	ENL BKS AN TR	4720	1941
72114	07307	ENL BKS AN TR	4720	1941

TABLE 2.1.3.3 BUILDINGS THAT NO LONGER EXIST NO ECOS EVALUATED

07313 07397 02708 00629 00642 00644 00656 00675 00677 00718 00803 00818 00830 002849 07308 00623	ENL BKS AN TR ENL BKS AN TR ENL BKS BASIC EN PERS DINE	4720 4720 4720 2360 2650 3100 2650 2360 2360 2631 2372 2208 2208 2360	1941 1941 1941 1951 1951 1942 1942 1941 1941 1942 1951 1942
02708 00629 00642 00644 00656 00675 00677 00718 00803 00818 00830 02849 07308 00623	ENL BKS BASIC EN PERS DINE	4720 2360 2650 3100 2650 2360 2360 2631 2372 2208	1941 1951 1951 1942 1942 1941 1941 1942 1951
00629 00642 00644 00656 00675 00677 00718 00803 00818 00830 002849 07308 00623	EN PERS DINE	2360 2650 3100 2650 2360 2360 2631 2372 2208	1951 1951 1942 1942 1941 1941 1942 1951
00642 00644 00656 00675 00677 00718 00803 00818 00830 002849 07308 00623	EN PERS DINE	2650 3100 2650 2360 2360 2631 2372 2208	1951 1942 1942 1941 1941 1942 1951
00644 00656 00675 00677 00718 00803 00818 00830 02849 07308 00623	EN PERS DINE	3100 2650 2360 2360 2631 2372 2208	1942 1942 1941 1941 1942 1951 1942
00656 00675 00677 00718 00803 00818 00830 02849 07308 00623	EN PERS DINE	2650 2360 2360 2631 2372 2208 2208	1942 1941 1941 1942 1951 1942
00675 00677 00718 00803 00818 00830 02849 07308 00623	EN PERS DINE	2360 2360 2631 2372 2208 2208	1941 1941 1942 1951 1942
00677 00718 00803 00818 00830 02849 07308 00623	EN PERS DINE	2360 2631 2372 2208 2208	1941 1942 1951 1942
00718 00803 00818 00830 02849 07308 00623	EN PERS DINE	2631 2372 2208 2208	1942 1951 1942
00803 00818 00830 02849 07308 00623	EN PERS DINE EN PERS DINE EN PERS DINE EN PERS DINE	2372 2208 2208	1951 1942
00818 00830 02849 07308 00623	EN PERS DINE EN PERS DINE EN PERS DINE	2208 2208	1942
00830 02849 07308 00623 00623	EN PERS DINE EN PERS DINE	2208	
02849 07308 00623 00623	EN PERS DINE		1941
07308 00623 00623		2360	
00623 00623	EN PERS DINE		1941
00623 00623		3250	1951
00623	DET DAY ROOM	2360	1941
	DET DAY ROOM	2527	1941
04060	OFF QTR TRANS	7670	1941
04061	OFF QTR TRANS	7670	1941
04062	OFF QTR TRANS	7670	1941
04063	OFF QTR TRANS	7670	1941
04069	OFF QTR TRANS	7670	1941
04070	OFF QTR TRANS	7670	1941
04071	OFF QTR TRANS	7670	1941
04073	OFF QTR TRANS	7670	1941
04074	OFF QTR TRANS	7670	1941
			1941
			1941
			1941
			1941
			1941
			1941
			1941
			1973
			1941
			1941
			1941
			1943
			1941
			1941
			1941
			1942
			1941
			1941
			1941
			1941
			1941
	RECREATION BLDG	1144	1941
	06635 06636 06639 06640 00212 00217 00219 02337 02336 06646 04065 00662 00680 00723 00725	06635         OFF QTR TRANS           06636         OFF QTR TRANS           06639         OFF QTR TRANS           06640         OFF QTR TRANS           06212         REL EDUC FAC           00217         REL EDUC FAC           02219         REL EDUC FAC           02336         UNIT CHAPEL           04065         CIV CLUB FAC           0662         RECREATION BLDG           06723         RECREATION BLDG           00723         RECREATION BLDG           00730         RECREATION BLDG           02712         RECREATION BLDG           02712         RECREATION BLDG           02834         RECREATION BLDG           02835         RECREATION BLDG           02845         RECREATION BLDG	06635       OFF QTR TRANS       7670         06636       OFF QTR TRANS       7670         06639       OFF QTR TRANS       7670         06640       OFF QTR TRANS       7670         00212       REL EDUC FAC       3106         00217       REL EDUC FAC       4720         00219       REL EDUC FAC       4720         02337       REL EDUC FAC       1200         02336       UNIT CHAPEL       3765         04065       CIV CLUB FAC       6884         04065       CIV CLUB FAC       6884         04065       CIV CLUB FAC       6884         040662       RECREATION BLDG       1144         040723       RECREATION BLDG       1144         040725       RECREATION BLDG       1144         040730       RECREATION BLDG       1144         02712       RECREATION BLDG       1144         02716       RECREATION BLDG       1144         02834       RECREATION BLDG       1144         02835       RECREATION BLDG       1144         02845       RECREATION BLDG       1144

TABLE 2.1.3.3 BUILDINGS THAT NO LONGER EXIST NO ECOS EVALUATED

CATEGORY	BLDG	CATEGORY_DESCR	AREA (SQ FT)	YEAR	
74069	02907	RECREATION BLDG	1144	1941	
74069	06643	RECREATION BLDG	2892	1941	
74069	06649	RECREATION BLDG	18899	1941	

TABLE 2.1.3.4 - BUILDINGS THAT ARE NOT LOCATED AT FORT KNOX NO ECOS EVALUATED

CATEGORY	BLDG	CATEGORY/DESCRIPTION	AREA (SQ FT)	YEAR
17130	K0105	APPL INST BLDG	3217	1959
17140	SP002	ARMY RES CENTER	3140	1959
17140	B0001	ARMY RES CENTER	33900	1950
17140	B0003	ARMY RES CENTER	52398	1980
17140	B0100	ARMY RES CENTER	31689	1970
17140	BL002	ARMY RES CENTER	11734	1961
17140	BR001	ARMY RES CENTER	4396	1958
17140	C0300	ARMY RES CENTER	39869	1965
17140	C4076	ARMY RES CENTER	28950	1962
17140	C1003	ARMY RES CENTER	12483	1959
17140	CL002	ARMY RES CENTER	23700	1960
17140	CM002	ARMY RES CENTER	30403	1958
17140	CS001	ARMY RES CENTER	23930	1963
17140	D0001	ARMY RES CENTER	14343	1961
17140	D1026	ARMY RES CENTER	12124	1959
17140	DA001	ARMY RES CENTER	15100	1975
17140	DL002	ARMY RES CENTER	13255	1960
17140	FL004	ARMY RES CENTER	28974	1962
17140	FR002	ARMY RES CENTER	4396	1961
17140	H1052	ARMY RES CENTER	22634	1956
17140	JM001	ARMY RES CENTER	6919	1980
17140	KN002	ARMY RES CENTER	4396	1961
17140	L0001	ARMY RES CENTER	40509	1957
17140	LA003	ARMY RES CENTER	42328	1980
17140	M2002	ARMY RES CENTER	13350	1970
17140	MA002	ARMY RES CENTER	4396	1961
17140	ML002	ARMY RES CENTER	13000	1981
17140	MN001	ARMY RES CENTER	11759	1958
17140	O2052	ARMY RES CENTER	4396	1960
17140	PM003	ARMY RES CENTER	11947	1960
17140	S1006	ARMY RES CENTER	25039	1956
17140	TD001	ARMY RES CENTER	23623	1962
17140	TR002	ARMY RES CENTER	4476	1962
17140	W0001	ARMY RES CENTER	11800	1961
17140	W4051	ARMY RES CENTER	20799	1962
17140		ARMY RES CENTER	29212	1958
	X2001 X2076	ARMY RES CENTER	23652	1951
17140	Y2076 Z0001	ARMY RES CENTER	13955	1970
17140		VEH MNT SH ORG	3892	1962
21410	B0002	VEH MNT SH ORG	6298	1970
21410	B0101 BL003	VEH MNT SH ORG	2519	1961
21410		VEH MNT SH ORG	1325	1958
21410	BR012	VEH MNT SH ORG	8882	1919
21410	C0077		7498	1965
21410	C0301	VEH MNT SH ORG	6256	1962
21410	C4077	VEH MNT SH ORG	3690	1952
21410	CI004	VEH MNT SH ORG		
21410	CL003	VEH MNT SH ORG	3700	1960
21410	CM003	VEH MNT SH ORG	6009	1958

TABLE 2.1.3.4 - BUILDINGS THAT ARE NOT LOCATED AT FORT KNOX NO ECOs EVALUATED

CATEGORY	BLDG	CATEGORY/DESCRIPTION	AREA (SQ FT)	YEAR
21410	CS002	VEH MNT SH ORG	3800	1963
21410	D0002	VEH MNT SH ORG	2587	1972
21410	D1027	VEH MNT SH ORG	3065	1960
21410	DA002	VEH MNT SH ORG	2937	1975
21410	DL003	VEH MNT SH ORG	5529	1960
21410	FL005	VEH MNT SH ORG	12964	1962
21410	FR003	VEH MNT SH ORG	1325	1961
21410	FT187	VEH MNT SH ORG	3865	1975
21410	H1053	VEH MNT SH ORG	3716	1960
21410	KN003	VEH MNT SH ORG	1325	1959
21410	L0002	VEH MNT SH ORG	6092	1957
21410	LM002	VEH MNT SH ORG	2656	1977
21410	M2003	VEH MNT SH ORG	0	1979
21410	MA003	VEH MNT SH ORG	1325	1961
21410	ML003	VEH MNT SH ORG	4300	1981
21410	MN011	VEH MNT SH ORG	2656	1959
21410	O2053	VEH MNT SH ORG	1325	1960
21410	PM004	VEH MNT SH ORG	2640	1960
21410	RS011	VEH MNT SH ORG	14440	1946
21410	S1007	VEH MNT SH ORG	6097	1956
21410	SP003	VEH MNT SH ORG	2656	1959
21410	TD002	VEH MNT SH ORG	3997	1962
21410	TR003	VEH MNT SH ORG	1325	1962
21410	W0002	VEH MNT SH ORG	2640	1960
21410	W4052	VEH MNT SH ORG	14400	1946
21410	X2002	VEH MNT SH ORG	6097	1956
21410	Y2077	VEH MNT SH ORG	6656	1951
21420	C0107	VEH MNT SH ORG	1312	1898
21420	LA004	VEH MNT SH ORG	4951	1980
21470	FL003	OIL STO BLDG	127	1962
21910	C0076	FE MAINT SHOP	2910	1892
21910	C0104	FE MAINT SHOP	840	1910
21910	C0105	FE MAINT SHOP	1500	1894
72140	P0904	CV DORMITORY	1600	1942
72321	P0900	DET LATRINE BDG	685	1942
72321	P1256	DET LATRINE BDG	564	1942
72321	P1266	DET LATRINE BDG	564	1942
72321	P1267	DET LATRINE BDG	864	1942
72321	P1268	DET LATRINE BDG	864	1942
72321	P1269	DET LATRINE BDG	864	1942
72321	P1389	DET LATRINE BDG	864	1942
72321	P1391	DET LATRINE BDG	864	1942
72321	P1423	DET LATRINE BDG	. 864	1942
72321	P1488	DET LATRINE BDG	864	1942
72321	P1499	DET LATRINE BDG	864	1942
72321	P1614	DET LATRINE BDG	864	1942
72321	P1712	DET LATRINE BDG	864	1942
73017	P1003	POST CHAPEL	3826	1942

TABLE 2.1.3.4 - BUILDINGS THAT ARE NOT LOCATED AT FORT KNOX NO ECOS EVALUATED

CATEGORY	BLDG	CATEGORY/DESCRIPTION	AREA (SQ FT)	YEAR
74046	P1738	OPEN DIN CONS	36515	1942
74050	C0103	EXCHANGE BRANCH	8135	1896
74069	P0910	RECREATION BLDG	4720	1942
74069	P0911	RECREATION BLDG	4720	1942
74069	P1021	RECREATION BLDG	4720	1942
74069	P1022	RECREATION BLDG	4720	1942
74069	P1023	RECREATION BLDG	4720	1942
74069	P1024	RECREATION BLDG	4720	1942

TABLE 2.1.3.5 - NON-APPROPRIATED FUND FACILITIES NO ECOS EVALUATED

CATEGORY	BLDG	CATEGORY/DESCRIPTION	AREA (SQ FT)	YEAR
74050	00103	EXCHANGE BRANCH	8135	1896
74050	00708	EXCHANGE BRANCH	4736	1987
74050	01490	EXCHANGE BRANCH	3929	1957
74050	02013	EXCHANGE BRANCH	12188	1988
74050	02318	EXCHANGE BRANCH	7180	1938
74050	04770	EXCHANGE BRANCH	4810	1958
74050	04991	<b>EXCHANGE BRANCH</b>	2580	1960
74050	05929	EXCHANGE BRANCH	4783	1969
74050	06585	EXCHANGE BRANCH	8440	1957
74050	06703	EXCHANGE BRANCH	6683	1941
74050	07037	EXCHANGE BRANCH	3854	1941
74051	00126	EXCHANGE CAFE	16200	1974
74052	01395	EXCH SVC STA	5573	1954
74052	01611	EXCH SVC STA	600	1975
74052	04990	EXCH SVC STA	2184	1960
74053	00127	EXCH MAIN RETL	83940	1974
74055	00051	EXCH WAREHOUSE	10110	1954
74055	00052	EXCH WAREHOUSE	9030	1954
74055	02198	EXCH WAREHOUSE	1440	1940
74056	00263	EXCH SVC OUTLET	2430	1941
74056	01328	EXCH SVC OUTLET	13102	1930
74056	02012	EXCH SVC OUTLET	3317	1987
74056	02320	EXCH SVC OUTLET	7180	1938
74056	02830	EXCH SVC OUTLET	1450	1942
74056	07040	EXCH SVC OUTLET	1296	1941

# 2 Methods and Approach

FY94S WATER CONSERVATION STUDY (WATER AND ENERGY), FT. KNOX, KY

## 2.2 CALCULATIONS

Energy calculations were performed using computerized techniques. Due to the large volume of calculations to be performed, standardized spreadsheets and procedures were developed. This assured consistent results and uniformity of quality in all of the calculations performed.

# 2.2.1 Baseline Water and Energy Consumption

The annual potable water production for Fort Knox from July 1993 through June 1994 was 1,421,100,000 gallons. The volume of sewage treated was 1,055,500,000. The net volumetric difference between potable water produced and sewage treated is 365,600,000 gallons more of potable water produced. Factors that affect the net differences are irrigation, evaporation, and storm water infiltration. The annual rainfall corresponding to the same period came to 50 inches. It is quite possible that the metering methods are not accurate.

The following sections will describe the method for calculating the baseline energy consumption for each of the ECOs.

# 2.2.1.1 Baseline Water and Energy Consumption

The baseline water and energy consumption for each ECO was calculated using a LOTUS123 spreadsheet. The water consumption was modeled using industry standards, field measurements and population data at Fort Knox. The information necessary to calculate the baseline include the following:

- 1. Category Codes
- 2. Square Footage and Age
- 3. Occupancy Schedule
- 4. Plumbing Fixture Count
- 5. Water Flow Measurements
- 6. Fuel Sources

The above information was obtained during the field survey.

# 2.2.2 ECO Water and Energy Consumption

The following sections describe how the water and energy savings for each ECO was calculated.

# 2.2.2.1 ECO Water and Energy Consumption: ECO-1 Spring Loaded Faucets

The water and energy savings are calculated using the differential between the measured existing flow rate and the new flow rate. The new flow rate is based upon manufacturer data. American Society of Heating, Refrigerating and Air-conditioning Engineers and American Society of Plumbing Engineer standards were used to estimate frequency of demand.

# 2.2.2.2 ECO Water and Energy Consumption: ECO-2 Faucet Aerators

The water and energy savings are calculated using the differential between the measured existing flow rate and the new flow rate. The new flow rate was obtained from manufacturer data. The new flowrate is 50% of the existing measured flowrate. American Society of Heating, Refrigerating and Air-conditioning Engineers standards were used to calculate daily consumption. Building occupancy data was used in the calculations.

# 2.2.2.3 ECO Water and Energy Consumption: ECO-2FH Faucet Aerators (Family Housing)

The water and energy savings are calculated using the differential between the measured existing flow rate and the new flow rate. The new flow rate was obtained from manufacturer data; the new flowrate is 50% of the existing measured flow rate. American Society of Heating, Refrigerating and Air-conditioning Engineers standards were used to calculate daily consumption. Family housing population data was used in the calculations.

# 2.2.2.4 ECO Water and Energy Consumption: ECO-3 Flush Valve Retrofits for Water Closets

The water and savings are calculated using the differential between the existing flow rate and the new flow rate. The existing flush valve flow rate of 4.5 gallons per flush, or 17 liters per flush, was determined in the field. The new flush valve flow rate of 3.5 gallons per flush, or 13.2 liters per flush, is based upon manufacturer performance data. American Society of Plumbing Engineers standards were used to estimate frequency of demand and daily consumption. Building occupancy data was used in the calculations.

# 2 METHODS AND APPROACH

FY94S WATER CONSERVATION STUDY (WATER AND ENERGY), FT. KNOX, KY

# 2.2.2.5 ECO Water Consumption: ECO-3FH Water Closet Replacements (Family Housing)

The water and savings are calculated using the differential between the existing flow rate and the new flow rate. The existing flow rate was determined in the field to be 5 gallons per flush, or 19 liters per flush. The new flow rate was based upon manufacturer data of 1.6 gallons per flush, or 6 liters per flush. American Society of Plumbing Engineers standards were used to estimate frequency of demand. Family housing population data was used in the calculations. Five flushes per day, per occupant, were used.

# 2.2.2.6 ECO Water Consumption: ECO-4 Flush Valve Retrofits for Urinals

The water and savings are calculated using the differential between the existing flow rate and the new flow rate. The existing flow rate of 1.5 gallons per flush, or 5.7 liters per flush, was measured in the field. The new flow rate of 1.0 gallons per flush, or 3.8 liters per flush, is based upon manufacturer performance data. American Society of Plumbing Engineers standards were used to estimate frequency of demand. Building occupancy data was used in the calculations.

# 2.2.2.7 ECO Water and Energy Consumption: ECO-6 Dining Facilities (Kitchen) Retrofits

The water and energy savings are calculated using the differential between the measured existing flow rate and the new flow rate. The retrofit evaluated consisted of installing aerators on the kitchen sinks that were not used for pot filling. The aerators were assumed to decrease the flow rate by 50% per manufacturer data. American Society of Heating, Refrigerating and Air-conditioning Engineers standards were used to estimate frequency of demand.

# 2.2.2.8 ECO Water and Energy Consumption: ECO-7 Golf Course Irrigation

The potable water meter readings were used to determine the annual consumption. The cost to switch to a raw water well supply was calculated using calculated pump run times and brake horsepower. The calculations were based upon a well depth of 200 feet and a casing size of six inches. The estimated well pump horse power is 75 horsepower per well.

# 2.2.2.9 ECO Water and Energy Consumption: ECO-8 Post Laundry Retrofits

The steam loss from failed steam traps was calculated using Napiers equation and boiler plant operating logs.

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2.2.2.10 ECO Water and Energy Consumption: ECO-9 Water Treatment Plant's and Well Field's Motors and Pumps

The existing water pump and motor efficiencies were evaluated. The water pumps were found to be very efficient. However, the pump motors were not high efficiency motors. The electrical savings were calculated for replacing the existing motors with high efficiency motors.

2.2.2.11 ECO Water and Energy Consumption: ECO-10 Manhole Sump Pump Repairs (Heating) Life Cycle Cost Analyses

The energy savings were determined by calculating the differential piping heat loss between piping in a flooded manhole and a dry manhole.

2.2.2.12 ECO Water and Energy Consumption: ECO-11 Sensor Controls for Faucets

The water and energy savings are calculated using the differential between the measured existing flow rate and the new flow rate. American Society of Heating, Refrigerating and Air-conditioning Engineers standards were used to estimate frequency of demand.

2.2.2.13 ECO Water and Energy Consumption: ECO-12 Water Heater Insulation Blankets (Family Housing)

The energy savings were determined by calculating the differential in heat loss between the water heater with, and without, the insulating blanket.

2.2.2.14 ECO Water Consumption: ECO-16 Cooling Tower Water Treatment

The water savings were calculated using the differential in blowdown rate between the existing chemical water treatment system and a new ozone water treatment system. The existing blowdown rate was determined in the field and is based upon 3 cycles of concentration. The cycles of concentration for the new ozone treatment system is calculated to be 6 cycles. The savings is the differential in the annual water blowdown losses and the cost of chemicals.

2.3 ECOs REJECTED AFTER ANALYSIS

ECOs 9, 11, 12, and 16 were rejected due to insufficient savings after calculations were completed.

# METHODS AND APPROACH FY94S WATER CONSERVATION STUDY (WATER AND ENERGY), FT. KNOX, KY

# 2.3.1 ECO-9 Water Treatment Plants and Wellfield Motors and Pumps

The water treatment plant and well field motors were evaluated as ECO-9. Savings are based on the installation of high efficiency motors. The energy savings that result are not great enough to justify replacement of all motors at this time. It is recommended to install higher efficiency motors when the existing motors need to be replaced.

The LCCID report calculation sheet and cost estimate for ECO-9 are in Appendix D.

#### 2.3.2 FCO-11 Sensor Controls for Faucets

Sensor controls for faucets, urinals and toilets were evaluated for two barracks. It is evident that the savings do not justify the cost to install these systems. Other ECOs have higher SIR and lower payback periods so sensors were not evaluated for all buildings.

The water savings is assumed to be equal to that calculated for ECO-1, ECO-3, and ECO-4. The LCCID reports and cost estimates are in Appendix D.

### 2.3.3 ECO-12 Water Heater Insulation Blankets

The addition of an insulation blanket on hot water heaters in family housing units does not result in significant energy savings. Most water heaters are well insulated and additional insulation does not reduce heat loss significantly. This ECO was evaluated for two family housing units. It is evident that the payback period and SIR are very poor, therefore no other buildings were evaluated for this ECO.

The LCCID reports, calculation sheets, and cost estimates for this ECO are in Appendix D.

# 2.3.4 ECO-16 Cooling Tower Water Treatment

The water and chemical savings calculated for switching from chemical water treatment to ozone water treatment were insufficient to achieve a payback of less than ten years. The cooling tower operates only six months a year. If the tower operated year round, the project may have had payback of less than ten years.

The calculation sheets for this ECO are in Appendix D.

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# 2.4 COST ESTIMATES

The cost estimates for the ECOs were obtained using a variety of sources. This section explains how each part of the cost estimate was determined.

The initial cost for each ECO is the sum of the construction costs for the project and the project costs. The construction costs include all costs in materials, labor, and contractor's overhead and profit. The project costs include supervision, inspection, and overhead (SIOH) for the project and the project design costs.

#### 2.4.1 Construction Costs

The construction costs for each ECO were estimated using MeansData for Windows Spreadsheets, Version 2.0a, cost estimating software. Prices not available in the accompanying database were obtained using a combination of sources. These sources include the following:

- Local suppliers and vendors
- Systems Corp Estimating Data

All pricing has been adjusted, where applicable, to represent the labor costs in the Fort Knox labor market. The construction cost estimates have been prepared to include a reasonable level of detail for each ECO calculated. The construction costs include an additional contingency and 10% profit. A minimum contingency of 10% was used, higher contingencies were used on some projects.

### 2.4.2 Project Costs

The project costs for each ECO include the cost of supervision, inspection, and overhead required to complete the project. A value of 5.0% of the construction cost has been used for the SIOH. Also included in the project costs is the cost to design each ECO. The design cost has been included at a fixed value of 5.0% of construction cost. This approach assures consistent values have been used for the project costs, allowing for combination of ECOs into larger projects without the need to adjust these values.

# 2.5 ECO LIFE CYCLE COSTS

The life cycle cost analyses for the ECOs are a combination of energy costs, investment costs, maintenance costs, and replacement costs. Each of these components may, or may not, be significant

# FY94S WATER CONSERVATION STUDY (WATER AND ENERGY), FT. KNOX, KY

factors in determining the life cycle cost of the project. Each of these cost components has been evaluated for each ECO to determine the contribution, if any, to the life cycle cost of the project.

The life cycle costs were calculated using the computer program Life Cycle Costing in Design (LCCID) as required in the Scope of Work.

# 2.5.1 Energy and Water Costs

Energy costs for each type of fuel used in the facilities included in this project were obtained from the installation and through the Defense Energy Information System (DEIS). The costs were obtained along with the amount of energy used for FY93. Average annual water, sewage and energy costs per unit were calculated. Electricity, fuel oil and natural gas are the only sources of energy related to the study.

	Cost/MBtu
Electric Fuel Oil	= \$0.02505/KWH or \$25.05/MWH = \$5.05/MBtu or \$17.15/MWH
Natural Gas	= \$3.10/MBtu or \$10.51/MWH
	Cost/Kgal
Water	= \$0.9409/KGAL or \$0.249/Kliter
Sewage	= \$0.6292KGAL or \$0.160/Kliter

# 2.5.2 Maintenance and Replacement Costs

The maintenance and operating costs/savings for each ECO were calculated, where applicable. First considered was whether the annual recurring (maintenance and operation) non-energy costs would significantly change as a result of each ECO. These values are sometimes unjustifiably manipulated to produce the desired results for the project economic analysis. Therefore, it was typically assumed maintenance and operation activities will continue at the same rate as before the project. However,

# 2 METHODS AND APPROACH

FY94S WATER CONSERVATION STUDY (WATER AND ENERGY), FT. KNOX, KY

readily identifiable differences, such as boiler maintenance, have been included. The estimated costs were obtained from the Means Facilities Maintenance and Repair Costs Data, 1994. These costs are shown on each corresponding life cycle summary sheet included in this report.

The replacement costs (non-energy non-annual recurring cost) for each ECO will be evaluated in the same manner as non-energy annual recurring cost. An example of this type of cost item is the replacement of the cartridge in spring-loaded faucets.

It is the policy of Systems Corp to be conservative when estimating these more subjective cost components--which, if improperly evaluated, could result in inappropriate project qualification and funding decisions.

# 3 ECIP PROJECT 1

T 1
FY94S Water Conservation Study (Water and Energy), Ft. Knox, KY

This section contains the project description and the DD1391 forms for ECIP Project FH-1, Family Housing Water Conservation Phase I improvements to 328 Family Housing Units. Two lists of the buildings included in the project follow the DD1391 forms. The first list includes all buildings considered in the project in numerical order. The second list shows which buildings were used to model unsurveyed buildings. Following these lists are the LCCID report and the cost estimate for the proposed project. Calculation sheets for the individual buildings follow the project cost estimate. Below is a detailed index of the information included in this section.

DD1391 Form
Table 3.1 ECIP FH-1 - Family Housing
Table 3.2 Buildings Modeled by Surveyed Buildings
Project LCCID Report
Cut Sheets/Product Information
Project Cost Estimate 3-13
Building Calculation Sheets

DATE:

22 December 1994

PROJECT NO .:

ECIP-FH1

PROJECT TITLE:

Family Housing Water Conservation Phase I

INSTALLATION:

Fort Knox

LOCATION:

Kentucky

### PRIMARY FACILITY

Water Closets and Faucet Aerators

\$887,000

EGEN A APPEN CONTENT A CT COCT	\$733,636
ESTIMATED CONTRACT COST	\$733,030
CONTINGENCY PERCENT (10%)	73,364
SUBTOTAL	807,000
SUPERVISION, INSPECTION & OVERHEAD (5%)	40,350
DESIGN COST	40,350
TOTAL REQUEST	887,700
TOTAL REQUEST (ROUNDED)	\$888,000

Replace water closets in 1354 family housing units with water saving, 6 liters (1.6 gallons) per flush water closets, and install faucet aerators in 328 family housing units. All water closets will be of the flush tank type. The project will significantly reduce potable water consumption and sanitary waste production.

DATE:

22 December 1994

PROIECT NO .:

FCIP-FH1

PROIECT TITLE:

Family Housing Water Conservation Phase I

INSTALLATION:

Fort Knox

LOCATION:

Kentucky

# PROJECT:

Replace water closets in 1354 family housing units with water saving, 6 liters (1.6 gallons) per flush water closets, and install faucet aerators in 328 family housing units.

### **REQUIREMENTS:**

Fort Knox utilizes inefficient outdated water closets in its family housing units. The existing water closets consume significantly more water and generate greater quantities of sanitary waste per flush than the new standard water saving water closet. The existing inefficient systems place greater demand on the water table, water treatment plant and waste treatment plant. The U.S. Army Corp of Engineers, Louisville District, contracted an Energy Engineering Analysis Program (EEAP) Water Conservation Study of the Post. The study identified energy and water conservation opportunities. Life cycle cost analysis was performed on each opportunity to determine its discounted savings-to-investment ratio (SIR) and estimated payback period. This project has a SIR of 2.61 and a simple payback period of 5.73 years. The project exceeds the minimum requirements of an SIR greater than 1.25 and a simple payback of less than 10 years.

#### **CURRENT SITUATION:**

The family housing units at Ft. Knox have inefficient water closets and lack aerators at many sinks. The family housing units consume more water and generate more sanitary waste than is necessary. The new water closets and aerators will greatly reduce the water consumption and waste generated.

#### IMPACT IF NOT PROVIDED:

If this project is not implemented, 1354 family housing units will continue to consume more water and generate more waste than necessary. The U.S. Army will fail to realize an estimated \$155K in annual savings (FY95\$) and a total discounted savings of \$2.32M during the twenty year life of the project.

# ADDITIONAL:

A life cycle cost analysis was performed on the project. The project will realize water savings of over 2.6 times the initial investment cost and will pay for itself in less than 5.8 years.

Ft. Knox is not on the list of installations considered for closure or realignment.

DATE:

22 December 1994

PROJECT NO .:

ECIP-FH1

PROJECT TITLE:

Family Housing Water Conservation Phase I

INSTALLATION:

Fort Knox

LOCATION:

Kentucky

SECTION 11 - ECONOMIC ANALYSIS DATA

# 11D ECONOMIC JUSTIFICATION SUMMARY

This water conservation project is recommended for funding. A life cycle cost analysis was performed on each portion of this project and on the overall project. The overall project will realize water savings of over 2.6 times the initial investment cost and will pay for itself in less than 5.8 years.

TABLE 3.1 ECIP FH-1 - FAMILY HOUSING

414 B	443 A	1201	1436 A
414 A	447	1202	1436 B
415 A	448	1203	1438 B
415 B	449 B	1204	1438 A
416 A	449 A	1401	1439 A
416 B	450	1402	1439 B
417 A	451 A	1403	1440 A
417 B	451 B	1404	1440 B
418 A	452 A	1405	1441 B
418 B	452 B	1406	1441 A
419	453 B	1408	1442 A
419 B	453 A	1409	1442 B
420 B	454 A	1410	1443 B
	454 B	1411 A	1443 A
420 A	454 B 455 A	1411 B	1444 A
421 B		1411 B 1412	1444 B
421 A	455 B		1444 A
422 A	456 B	1413 A	1444 A 1445 B
422 B	456 A	1413 B	
423	457 B	1416 A	1446 B
424	457 A	1416 B	1446 A
425	458 B	1417	1447
426	458 A	1418 A	1453 B
427	459 A	1419 B	1453 A
431 A	459 B	1419 A	1454 B
431 B	460 B	1420 A	1454 A
432 A	460 A	1420 B	1455 B
432 B	461 A	1422 A	1455 A
434 B	461 B	1422 B	1457 A
434 A	462 B	1423	1457 B
435 A	462 A	1424 B	1458 B
435 B	1004	1424 A	1458 B
436 A	1120	1426	1458 A
436 B	1122	1427	1458 A
437 A	1125 A	1429 B	1459 B
437 B	1125 B	1429 A	1459 A
438 B	1126 A	1430 A	1460 A
438 A	1126 B	1430 B	1460 B
439 A	1127 A	1431 B	1461 A
439 B	1128 A	1431 A	1461 B
440 B	1128 B	1432	1462 A
440 A	1132	1432 B	1462 B
441 A	1133	1433 B	1463 A
441 B	1134	1433 A	1463 B
442 A	1135	1434 A	1464 B
442 B	1136	1434 B	1464 A
443 B	1200	1435 A	1465 A
1.5 5	1200		

1465 B	4257	4332 B	7511 A
	4258	4332 A	7511 B
1466 B			7512 A
1466 A	4259	4333 A	
4016	4260	4333 B	7512 B
4026	4261	4334 A	7513 A
4026	4262	4334 B	7513 B
4027	4263	4335 B	7514 A
4029	4264	4335 A	7514 B
4030	4265	4336 B	7515 A
4031	4266	4336 A	7515 B
4032	4267	4338 B	7516 B
4033	4268	4338 A	7516 A
4034	4269	4339 B	7518 B
4035	4270	4339 A	7518 A
4036	4271	4340 B	7518 B
4037	4272	4341 B	7519 A
4038	4273	4341 B	7519 B
4039	4274	4341 A	7520 A-H
4040	4276	4342 A	7521 B
4041	4277	4342 B	7521 A
4043	4278	4343 A	7522 B
4044	4279	4343 B	7522 A
4045	4280	4349	7523 B
4046	4281	4351	7523 A
4047	4282	4354	7523 B
4048	4283	4356	7524 A-H
4049	4284	4357	7525 A
4086	4285	4358	7526 B
4087	4286	4359	7526 A
4088	4287	4360	7527 B
4089	4288	4361	7527 A
4090	4301 A	4362 A	7528 A
4091	4301 B	4362 B	7528 B
4092	4303 A	4363 B	7529 A
4093	4303 B	4363 A	7529 B
4094	4305 A	4363	7530 A
4095	4305 B	4364 B	7530 B
4096	4306 A	4364 A	7531 A
4098	4306 B	4365 A	7531 B
4099	4307 B	4365 B	7532 A
4100	4307 A	4367	7532 B
4102	4308 A	4369	7533 A
4103	4308 B	5054	7533 B
4105	4310 A	5314	7534 B
4106	4330 B	7480 A-H	7534 A
4107	4330 A	7493 A-H	7535 A
4113	4331 B	7510 A	7535 B
4114	4331 A	7510 B	7536 A
1117			

7536 B	7556 B	7874 B	9045 A-D
7537 B	7557 A	7874 A	9046 A-H
7537 A	7557 B	7876 B	9047 A-H
7538 A	7558 A	7876A	9048 A, C-H
7538 B	7558 B	7878A	9049 A-H
7539 A	7559 A	7878B	9052 A-H
7539 B	7559 B	7801 B - 7820 B	9053
7540 B	7740 A-H	7801 A - 7868 A	9053 A, C-H
7540 A	7744 A-G	7822 B - 7833 B	9054 A-G
7541 A	7745 A-H	7835 B - 7860 B	9055 A-H
7541 B	7746 A-D	7862 B - 7872 B	9056 A-D
7542 B	7747 B-G	7870 A - 7872 A	9057 A-H
7542 A	7747 A-H	7880 B - 7888 B	9058 A-H
7543 A	7748 A-G	7880 A - 7888 A	9060 A-D
7543 B	7749 A-H	7980 A-H	9109 A-H - 9111 A-H
7544 A	7749 B-G	7982 A-D	9110 A-H
7544 B	7750 D	7983 A-D	9112 A-D
7545 A	7750 B-C	7984 A-H	9113 A-H
7545 B	7750	7985 A-H	9114 A-D
7546 A	7751 B	7987 A-D	9115 A-H
7546 B	7751 A-D	7989 A-H	9115 A-H
7547 A	7751	7991 A-H	9116 A-D
7547 B	7753 A-G	9019	9117 A-H
7548 A	7754 A-G	9025 A-G	9118 A-D
7548 B	7755 A-H	9026 A-H	9119 A-H
7549	7756 A-H	9028 A-H	9120 A - 9140 A
7550 A	7757 A-D	9030 A-H	9120 B
7550 B	7758 A-H	9031 A-D	9122 B - 9140 B
7551 A	7759 A-D	9032 A-H	9141
7551 B	7760 A-H	9032 A-H	9142 A - 9163 A
7552 A	7761 B-C	9036 A-H	9142 B - 9163 B
7552 B	7761 A-D	9036 A-H	9206
7553 A	7762 A-D	9037 A-D	9211
7553 B	7762 B-C	9038 A-H	9222
7554 A	7770 A-D	9039 A-H	11127 B
7554 B	7770 B-C	9040 A-C	13435 B
7555 A	7772 A-H	9041 A-H	43460 A
7555 B	7821	9042 A-H	
7556 A	7869	9044 A-H	

TABLE 3.2 BUILDINGS MODELED BY SURVEYED BUILDINGS

BUILDINGS SURVEYED AND CALCULATED	BUILDINGS ASSUMED TYPICAL OF SURVEYED BUILDINGS
1426A	1122, 1132, 1133, 1134, 1135, 1136, 1125A, 1126A, 1127A, 1128A, 1401, 1402, 1411A, 1413A, 1416A, 1419A, 1420A, 1422A, 1424A, 1429A
1426В	1125B, 1126B, 1127B, 1128B, 1403, 1404, 1405, 1406, 1408, 1409, 1410, 1411B, 1412, 1413B, 1416B, 1417, 1419B, 1420B, 1422B, 1423, 1424B, 1427, 1429B, 1447
1432A	1120, 1200, 1201, 1202, 1203, 1204, 1430A & B, 1431A & B, 1432B, 1433A & B, 1434A & B, 1435A & B, 1436 A & B, 1438A & B, 1439A & B, 1440A & B, 1441A & B, 1442A & B, 1443A & B, 1444A & B, 1445A & B, 1446A & B, 1453A & B, 1454A & B, 1455A & B, 1456A & B, 1457A & B, 1458A & B, 1459A & B, 1460A & B, 1461A & B, 1462A & B, 14563A & B, 1464A & B, 1465A & B, 1466A & B, 9206, 9222
4358	4044, 4045, 4046, 4047, 4048, 4049, 4086, 4087, 4088, 4089, 4090, 4091, 4092, 4093, 4094, 4095, 4113, 4114, 415, 4116, 4117, 4118, 4119, 4121, 4326, 4328, 4337, 4349, 4351, 4354, 4356, 4357, 4359, 4360, 4361, 4367, 4369, 5054
4041	4027, 4028, 4032, 4035, 4037, 4100, 4103, 4106, 4107
4096	4026, 4029, 4030, 4031, 4033, 4034, 4036, 4038, 4039, 4040, 4043, 4098, 4099, 4102, 4105
4270	4257, 4258, 4259, 4260, 4261, 4262, 4263, 4264, 4265, 4266, 4267, 4268, 4269, 4271, 4272, 4273, 4274, 4276, 4277, 4278, 4279, 4280, 4281, 482, 4283, 4284, 4285, 4286, 4287, 4288
1363	4301A & B, 4303A & B, 4305A & B, 4306A & B, 4307A & B, 4308A & B, 4310A & B, 4330A & B, 4331A & B, 4332A & B, 4333A & B, 4334A & B, 4335A & B, 4336A & B, 4338A & B, 4339A & B, 4340A & B, 4341A & B, 4342A & B, 4343A & B, 4362A & B, 4363A & B, 4364A & B, 4365A & B,
419	414A, 415A, 416A, 417A, 418A, 420A, 421A, 422A, 431A, 432A, 434A, 435A, 436A, 437A, 438A, 439A, 440A,441A, 442A, 443A
450A	423, 424, 425, 426, 427, 447, 448, 449A, 451A, 452A, 453A, 454A, 455A, 456A, 457A, 458A, 459A, 460A, 461A, 462A, 1004
450B	414B, 415B, 416B, 417B, 418B, 419B, 420B, 421B, 422B, 431B, 432B, 434B, 435B, 436B, 437B, 438B, 439B, 440B, 441B, 442B, 443B, 449B, 451B, 452B, 453B, 454B, 455B, 456B, 457B, 458B, 459B, 460B, 461B, 462B, 4016

7549A	7510A, 7511A, 7512A, 7513A, 7514A, 7515A, 7516A, 7518A, 7519A, 7520A-H, 7521A, 7522A, 7523A, 7524A-H, 7525A, 7526A, 7527A, 7528A, 7529A, 7530A, 7531A, 7532A, 7533A, 7534A, 7535A, 7536A, 7537A, 7538A, 7539A, 7540A, 7541A, 7542A, 7543A, 7544A, 7545A, 7546A, 7547A, 7548A, 7550A, 7551A, 7552A, 7553A, 7554A, 7555A, 7556A, 7557A, 7558A, 7559A
7549B	7510B, 7511B, 7512B, 7513B, 7514B, 7515B, 7516B, 7518B, 7519B, 7521B, 7522B, 7523B, 7525B, 7526B, 7527B, 7528B, 7529B, 7530B, 7531B, 7532B, 7533B, 7534B, 7535B, 7536B, 7537B, 7538B, 7539B, 7540B, 7541B, 7542B, 7543B, 7544B, 7545B, 7546B, 7547B, 7548B, 7550B, 7551B, 7552B, 7554B, 7555B, 7556B, 7557B, 7558B, 7559B
7750	7744A-G, 7746A-D, 7747A & H, 7749A & H, 7750D, 7751A & D, 7757A-D, 7759A-D, 7761A & D, 7762A & D, 7770A & D, 7982A-D, 7983A-D, 7987A-D,
7751	7480A-H - 7493A-H, 7740A-H, 7745A-H, 7747B-G, 7748A-G, 7749B-G, 7750B & C, 7751B, 7753A-G, 7754A-G, 7755A-H, 7756A-H, 7758A-H, 7760A-H, 7761B & C, 7762B & C, 7770B & C, 7772A-H, 7980A-H, 7984A-H, 7985A-H, 7989A-H, 7991A-H, 9019, 9211
5314	9031A-D, 9037A-D, 9040A-C, 9045A-D, 9056A-D, 9060A-D, 9112A-D, 9114A-D, 9116A-D, 9118A-D
5475	9025A-G, 9026A-H - 9030A-H, 9032A-H - 9036A-H, 9038A-H, 9039A-H, 9042A-H - 9044A-H, 9046A-H, 9047A-H, 9049A-H - 9052A-H, 9054A-G, 9055A-H, 9057A-H, 9058A-H, 9109A-H - 9111A-H, 9113A-H, 9115A-H, 9117A-H, 9119A-H
7821	7801B - 7820B, 7822B - 7833B, 7835B - 7860B, 7862B - 7872B, 7874B, 7876B, 7878B, 7880B - 7888B
7869	7801A - 7868A, 7870A - 7872A, 7874A, 7876A, 7878A, 7880A - 7888A
9053	9028A-H, 9032A-H, 9036A-H, 9041A-H, 9048A & C-H, 9053A & C-H, 9110A-H, 9115A-H
9141A	9120A - 9140A, 9142A - 9163A
9141B	9120B, 9122B - 9140B, 9142B - 9163B

STUDY: ECIP-FH1 LIFE CYCLE COST ANALYSIS SUMMARY ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

LCCID FY95 (92) INSTALLATION & LOCATION: FT KNOX REGION NOS. 4 CENSUS: 3 PROJECT NO. & TITLE: ECIP-FH1 FAMILY HOUSING PROJECT 1 FISCAL YEAR 1995 DISCRETE PORTION NAME: WATER ANALYSIS DATE: 12-28-94 ECONOMIC LIFE 20 YEARS PREPARED BY: DERRINGTON 1. INVESTMENT A. CONSTRUCTION COST \$ 807000. B. SIOH \$ 40350. C. DESIGN COST \$ 40350. D. TOTAL COST (1A+1B+1C) \$ 887700. E. SALVAGE VALUE OF EXISTING EQUIPMENT \$ 0. F. PUBLIC UTILITY COMPANY REBATE \$ 887700. G. TOTAL INVESTMENT (1D - 1E - 1F) 2. ENERGY SAVINGS (+) / COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994 UNIT COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNTED \$/ MWH(1) MWH/YR(2) SAVINGS(3) FACTOR(4) SAVINGS(5) FUEL 0. 0. 0. 15.08 A. ELECT \$ 46.40 

 0.
 \$
 0.
 15.08

 0.
 \$
 0.
 18.57

 0.
 \$
 0.
 21.02

 374.
 \$
 3931.
 18.58

 0.
 \$
 0.
 16.83

 0.
 \$
 0.
 17.38

 \$
 0.
 14.88

 374.
 \$
 3931.

 0. 0. B. DIST \$ .00 C. RESID \$ .00 0. 374. 0. 0. 0. \$ 73033. \$ 0. \$ 0. D. NAT G \$ 10.51 E. COAL \$ .00 F. PPG \$ .00 M. DEMAND SAVINGS 0. 73033. N. TOTAL 3. NON ENERGY SAVINGS(+) / COST(-) A. ANNUAL RECURRING (+/-) 106686. (2) DISCOUNTED SAVING/COST (3A X 3A1) (1) DISCOUNT FACTOR (TABLE A) \$ 1587488. SAVINGS(+) YR DISCNT DISCOUNTED
COST(-) OC FACTR SAVINGS(+),
(1) (2) (3) B. NON RECURRING SAVINGS (+) / COSTS (-) SAVINGS(+)/ ITEM 10 \$ 887700. .74 656898. 1. REPLACEMENT 656898. d. TOTAL \$ 887700. C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 2244386. 4. FIRST YEAR DOLLAR SAVINGS 2N3+3A+(3Bd1/(YRS ECONOMIC LIFE))\$ 155002. 5.73 YEARS 5. SIMPLE PAYBACK PERIOD (1G/4) \$ 2317419. 6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) 7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) =2.61 (IF < 1 PROJECT DOES NOT QUALIFY) \*\*\*\* Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR):

N/A

- · Water-saving 1.5 gallon flush.
- Features Pressure-Clean™ flushometer tank system.
- Three-bolt quick connect system with factory-installed tank gasket and bolts.

K-3458 Wellworth Lite PC Toilet, vitreous china, 1.5 gallon flush. Close-coupled design with elongated bowl. Minimum roughing-in is 12" (305 mm).

Tank/bowl combination includes K-4333 bowl, K-4470 vitreous china tank with Kohler 81100 flushometer tank system, K-4471 tank cover and K-9434 chrome-plated trip lever.

IMPORTANT—For most satisfactory operation, a minimum static water pressure of 25 P.S.I. is required at the toilet supply inlet.

Recommended Seats and Supply K-4650 Lustra™ solid plastic seat with open front and cover.
K-4652 Lustra solid plastic seat with closed front and cover.
K-4670-C Lustra solid plastic seat

K-4670-C Lustra solid plastic seat (K-4681-C Black Black™) with open front and check hinge.

K-7637 %" angle supply with stop.

Tank Locks—Add suffix "-T" to product number.

Bedpan Lugs—Add suffix "-L" to product number.

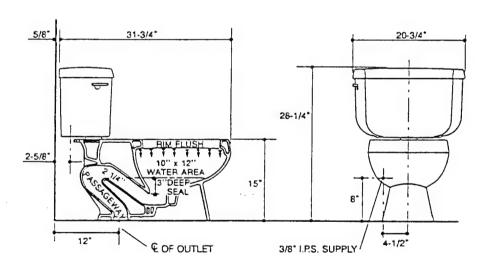
For complete color selection, see Colors section.



Wellworth Lite PC Toilet and Lustra seat (K-4652) in White.

U.S. Pat. Pendino







Estimate: ECO - 2 & 3 Date: 15-Dec-94 INSTALL AERATORS & WATER CLOSETS - FAMILY HOUSING Description: Project: LIMITED EEAP (WTR)Bid Date:
Location: FORT KNOX, KY Job #: 94013.03
Sq. footage: FAM HSG - GP 1 City indx:Louisville, KY Description \_\_\_\_\_ Manhours Matl Labor Equipment Sub Total ECO - 3 INSTALL 3.5 GAL FLUSH VALVE REPAIR KIT 1511410975 IN EXISTING WATER CLOSETS 46.00 Ea. 0.00 50.04 0.00 15.00 35.04 1.24 Unit values \$0 \$690 \$1,612 \$0 \$2,302 57.04 Totals ECO - 2 INSTALL AERATOR, LAVATORY FAUCET 1511412805 328.00 Ea. 8.08 7.08 \$2,321 0.00 1.00 0.00 0.25 Unit values \$328 \$0 \$2,649 82.00 \$0 Totals ECO - 3 INSTALL NEW WATER SAVING WATER CLOSET, TANK TYPE, 1521801100 FLOOR MNTD, 2PC WHITE W/SEAT, 1.6 GPF 1910.00 Ea. 4.02 235.00 114.30 0.00 7678.20 \$448,850 \$218,318 \$0 0.00 349.30 Unit values \$0 \$667,168 otals U15 MECHANICAL 7818 \$449,868 \$222,251 \$0 \$0 \$672,119

	=======		=======	==========	========	========
Line #	Descript:	ion				
	Manhours	Matl	Labor	Equipment	Sub	Total
		========	=======			========
ESTIMATE TOTAL	7818	\$449,868	\$222,251	\$0	\$0	\$672,119
SALES TAX MATL MARKUP LABOR MARKUP	0.00% 0.00% 0.00%	\$0 \$0	\$0			
EQUIPT MARKUP SUB MARKUP	0.00%		ų c	\$0	\$0	
TOTAL BEFORE CO CONTINGENCY BOND PROFIT	ONTINGENC 10.00% 0.00% 10.00%	\$449,868	\$222,251	\$0	\$0	\$672,119 \$67,212 \$0 \$67,212
JOB TOTAL						\$806,543

Estimate: ECO - 2 & 3 Date: 15-Dec-94
Description: INSTALL AERATORS & WATER CLOSETS - FAMILY HOUSING
Project: LIMITED EEAP (WTR)Bid Date:
Location: FORT KNOX, KY Job #: 94013.03
Sq. footage: FAM HSG - GP 1 City indx:Louisville, KY

oq.	Tootage.		1100	0.			
====	========	====	=====	===:	===	======	
			2	UMMU	ARY		

		OUNTAICE				_ 40
	Manhours	Matl	Labor	Equipment	Sub	Total
	========		=======			
U15 MECHANICAL	7818	\$449,868	\$222,251	\$0	\$0	\$672,119
TOTAL	7818	\$449,868	\$222,251	\$0	\$0	\$672,119
SALES TAX MATL MARKUP LABOR MARKUP	0.00% 0.00% 0.00%	\$0 \$0	\$0			
EQUIPT MARKUP SUB MARKUP	0.00% 0.00%			\$0	\$0	
TOTAL BEFORE CONTINGENCY BOND	ONTINGENC 10.00% 0.00%	\$449,868	\$222,251	\$0	\$0	\$672,119 \$67,212 \$0
PROFIT	10.00%					\$67,212
JOB TOTAL						\$806,543

	TH GAH SA945	1	KNOX WAT	SNO	TIIDY		10
	CALCI		노			DATE:	5 OCT 94
FACILITY NO.:	419 A		FUNCTION:		UNACCO	M PERS	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:	'	24	OF 21 UN	2
ECO Number	Existing Fixture System	1 1	Retrofited Fixture System	٤	Usage	Fixtures	Water Leaks
ECO Iype	Description SINK W/ AFRATOR	LPM 9.5	Description NO RETROFIT	D 0.	HRS/YR	Quantity 2	Eliminated LPY
Lavatory Sinks				2		ı	
ECO1 TOTAL:		LPM		LPM		2	0
2	KITCHEN SINK	9.5	NO RETROFIT	9.5	365	1	0
Misc. Sinks	SERVICE SINK		INSTALL AERATOR	9.5	09	-	
ECO2 TOTAL:		LPF		LPF	#FL/YR	2	0
3	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	14600	1	
Water Closets							
ECO3 TOTAL:		LPF		LPF	#FL/YR	-	0
4							
Urinals							
ECO4 TOTAL:		LPM		LPM	LPM HRS/YR	0	0
5 Shower Heads	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.5	245	-	0
ECO5 TOTAL:		TEMP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	TEMP		1	0
9	40 GAL REPUBLIC #406						
Water	CAPACITY: 38,000 BTU/H	325	REDUCE STORAGE TEMP	322	8760		
(GAS)				770	5	-	
ECO6 TOTAL:		***		1000年度		1	0

SYSTEMS CORP

Systems Engineering and Management Corporation, Knoxville, TN

Mater Rate:   0.42   \$/KL   Energy Rate:     \$ \$/KV	: Water Rate:       0.42       \$/K L       E         Gas Rate:       10.51       \$/MWH       D         er       Annual Water       Annual Energy Saving       E         er       Annual Water       Annual Energy Saving       C         er       Annual Water       Annual Energy Saving       C         ex       C       C       C         ex       A7,520       C       C         ex       C       C       C         ex       A7,520       C       C         ex       C       C       C         ex       C       C       C         ex       C       C       C         ex       C       C       C       C         ex <th< th=""><th>;; eg bu</th><th></th><th></th></th<>	;; eg bu		
Gas Rate:         10.51         \$/MWH         Demand Rate:         \$/KW           er         Annual Water         Annual ELEC         GAS         WATER         Total             Saving LPY KW         KWH         MWH         Dollar Saving         WATER         Total             Saving LPY KW         KWH         MWH         Dollar Saving         \$0.00         \$0.00             Saving LPY KW         KWH         MWH         Dollar Saving         \$0.00         \$0.00             Saving LPY KW         KWH         MWH         Dollar Saving         \$0.00         \$0.00             Saving LPY KW         KWH         MWH         Dollar Saving         \$0.00         \$0.00             Saving Saving Saving Color Saving Color Saving Savin	Gas Rate:         10.51         \$/MWH         D           er         Annual Water         Annual ELEC         ELEC         GAS           ex         Saving         LPY         KWH         MWH           fts         0         0         0           nks         0         0         0			Total  Total  Dollars Invested \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
er         Annual Water         Annual ELEC         ELEC         GAS         WATER         Total           iks         0         CONSUMPTION         ELEC         ELCO         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$	er Annual Water Annual Energy Saving		Total Solve \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$1.34 \$1.34	Total  Dollars Invested \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
ks         ELEC         ELEC         GAS         Dollar Saving         Dollar Saving           lks         0         0         \$0.00         \$0.00           c         47,520         0         0         \$0.00         \$0.00           c         47,520         0         0         \$0.00         \$0.00           c         47,520         0         0         \$0.00         \$0.00           c         0         0         \$0.00         \$0.00         \$0.00         \$0.00           c         0         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           c	Saving LPY KW KWH MWH  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 47,520 0 47,520 0 0 47,520 0 0 48,340 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		\$0.00 \$0.00 \$0.00 \$0.00 \$1.34 \$0.00 \$1.34	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
Ke   0   0   0   0   0   0   0   0   0	lks 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		\$0.00 \$0.00 \$0.00 \$0.00 \$1.34 \$0.00	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$9.70
Ke   0   \$0.00   \$0.00	iks         0         0         0           0         0         0         0           0         0         0         0           s         47,520         0         0           47,520         0         0         0           47,520         0         0         0           its         0         0         0           its         0         0         0           0         0         0         0           0         0         0         0           0         0         0         0           0         0         0         0           0         0         0         0           0         0         0         0           0         0         0         0           0         0         0         0           0         0         0         0           0         0         0         0           0         0         0         0           0         0         0         0           0         0         0         0           0	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$78.16 \$0.00 \$0.00 \$0.00	\$0.00 \$0.00 \$0.00 \$1.34 \$0.00	\$0.00 \$0.00 \$0.00 \$0.00 \$9.70
0         0         \$0.00         \$0.00           s         \$0.00         \$0.00         \$0.00           s         \$0.00         \$0.00         \$0.00           s         \$0.00         \$0.00         \$0.00           47,520         0         0         \$0.00           47,520         0         0         \$0.00           47,520         0         0         \$0.00           47,520         0         0         \$0.00           47,520         0         0         \$0.00           47,520         0         0         \$0.00           47,520         0         0         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0.00 \$0.00 \$0.00 \$0.20 \$0.00 \$78.16 \$0.00 \$0.00 \$0.00	\$0.00 \$0.00 \$1.34 \$1.34	\$0.00 \$0.00 \$0.00 \$9.70
0         0         \$0.00         \$0.00           s         \$0.00         \$0.00         \$0.00           s         \$0.00         \$0.00         \$0.00           47,520         0         0         \$0.00         \$1.34           47,520         0         0         \$0.00         \$1.34           47,520         0         0         \$0.00         \$1.34           48,340         0         0         \$0.00         \$0.00           48,340         \$0.00         \$0.00         \$0.00         \$0.00           48,340         \$0.00         \$0.00         \$0.00         \$0.00           50.00         \$0.00         \$0.00         \$0.00         \$0.00           60         \$0.00         \$0.00         \$0.00         \$0.00           60         \$0.00         \$0.00         \$0.00         \$0.00           80.00         \$0.00         \$0.00         \$0.00         \$0.00           80.00         \$0.00         \$0.00         \$0.00         \$0.00           80.00         \$0.00         \$0.00         \$0.00         \$0.00           80.00         \$0.00         \$0.00         \$0.00         \$0.00	0     0     0       0     0     0       2     47,520     0       47,520     0     0       188,340     0     0       188,340     0     0       0     0     <	\$0.00 \$0.00 \$0.20 \$0.00 \$78.16 \$0.00 \$0.00 \$78.16	\$0.00 \$0.00 \$1.34 \$0.00 \$1.34	\$0.00 \$0.00 \$9.70
s         0         \$0.00         \$0.00           s         47,520         0         \$0.20         \$1.34           40         0         \$0.20         \$1.34           47,520         0         0         \$0.00         \$1.34           47,520         0         0         \$0.00         \$1.34           48,340         0         \$0.00         \$0.00         \$0.00           48,340         0         \$0.00         \$0.00         \$0.00           188,340         0         \$0.00         \$0.00         \$0.00           188,340         0         \$0.00         \$0.00         \$0.00           50.00         \$0.00         \$0.00         \$0.00         \$0.00           188,340         0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00         \$0.00           HOT WITE         0.07         \$0.00         \$0.01         \$0.01	s 47,520 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0.00 \$0.20 \$0.00 \$0.00 \$78.16 \$0.00 \$0.00 \$78.16	\$0.00 \$1.34 \$0.00 \$1.34	\$0.00
\$ 47,520         \$ 60.20         \$ 1.34           \$ 0         \$ 60.00         \$ 60.00         \$ 60.00           \$ 188,340         \$ 60.00         \$ 60.00         \$ 60.00           \$ 188,340         \$ 60.00         \$ 60.00         \$ 60.00           \$ 188,340         \$ 60.00         \$ 60.00         \$ 60.00           \$ 188,340         \$ 60.00         \$ 60.00         \$ 60.00           \$ 188,340         \$ 60.00         \$ 60.00         \$ 60.00           \$ 0         \$ 60.00         \$ 60.00         \$ 60.00           \$ 0         \$ 60.00         \$ 60.00         \$ 60.00           \$ 0         \$ 60.00         \$ 60.00         \$ 60.00           \$ 0         \$ 60.00         \$ 60.00         \$ 60.00           \$ 0         \$ 60.00         \$ 60.00         \$ 60.00           \$ 0         \$ 60.00         \$ 60.00         \$ 60.00           \$ 0         \$ 60.00         \$ 60.00         \$ 60.00           \$ 0         \$ 60.00         \$ 60.00         \$ 60.00           \$ 0         \$ 60.00         \$ 60.00         \$ 60.00           \$ 0         \$ 60.00         \$ 60.00         \$ 60.00           \$ 60.00         \$ 60.00         \$ 60.00 </td <td>s       47,520       0         0       0       0         47,520       0       0         188,340       0       0         188,340       0       0         0       0       0         0       0       0         0       0       0         0       0       0         0       0       0         0       0       0         0       0       0         0       0       0</td> <td>\$0.20 \$0.00 \$0.20 \$78.16 \$0.00 \$0.00 \$78.16</td> <td>\$1.34 \$0.00 \$1.34</td> <td>\$9.70</td>	s       47,520       0         0       0       0         47,520       0       0         188,340       0       0         188,340       0       0         0       0       0         0       0       0         0       0       0         0       0       0         0       0       0         0       0       0         0       0       0         0       0       0	\$0.20 \$0.00 \$0.20 \$78.16 \$0.00 \$0.00 \$78.16	\$1.34 \$0.00 \$1.34	\$9.70
0         0         \$0.00         \$0.00           47,520         0         0         \$0.00         \$0.00           (ts         0         \$0.00         \$0.00         \$1.34           188,340         \$0.00         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00         \$0.00           ds         0         \$0.00         \$0.00         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           CONSUMPTION         0         \$0.07         \$0.01         \$0.01         \$0.01           (LITERS)         (LITERS)         \$0.07         \$0.07         \$0.07         \$0.07	0 0 0 0 0 188,340 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0.00 \$0.20 \$78.16 \$0.00 \$0.00 \$78.16	\$0.00	\$0.00
47,520         0         0         \$0.20         \$1.34           188,340         \$0.00         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00         \$0.00           ds         \$0         \$0.00         \$0.00         \$0.00           EST ANNUAL         \$0.00         \$0.00         \$0.00         \$0.00           CONSUMPTION         \$0.07         \$0.07         \$0.71           (LITERS)         \$0.07         \$0.71         \$0.71	47,520     0     0       188,340     0       0     0       188,340     0       0     0       0     0       0     0       0     0       0     0	\$0.20 \$78.16 \$0.00 \$0.00 \$78.16 \$0.00	\$1.34	>>:>>
188,340         \$78.16         \$78.16           \$0         \$0.00         \$0.00           \$0         \$0.00         \$0.00           \$0         \$0.00         \$0.00           \$0         \$0.00         \$0.00           \$0         \$0.00         \$0.00           \$0         \$0.00         \$0.00           \$0         \$0.00         \$0.00           \$0         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.23         \$0.00         \$0.01           \$0.71         \$0.71         \$0.71	188,340 0 0 188,340 0	\$78.16 \$0.00 \$0.00 <b>\$78.16</b> \$0.00		\$9.70
tfs         0         \$0.00         \$0.00           188,340         \$0.00         \$0.00           188,340         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           ds         0         \$0.00           ds         0         \$0.00           EST ANNUAL         \$0.23         \$0.00           HOT WITR         0.23         \$0.00           CONSUMPTION         0.07         \$0.07           43,946         \$0.07         \$0.71	188,340 0 0	\$0.00 \$0.00 <b>\$78.16</b> \$0.00	\$78.16	\$418.80
0         \$0.00         \$0.00           188,340         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           color         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           est Annual         0         \$0.00         \$0.00           HOT WTR         0.23         \$0.00         \$0.00           CONSUMPTION         0.07         \$0.71           (LITERS)         \$0.07         \$0.71	188,340 0 0	\$0.00 \$78.16 \$0.00	\$0.00	\$0.00
188,340         \$78.16         \$78.16         \$78.16           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           eST ANNUAL         0         \$0.00         \$0.00           HOT WTR         0.23         \$2.42           CONSUMPTION         0.07         \$0.71           (LITERS)         0         \$0.07	188,340 0 0	<b>\$78.16</b> \$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00           HOT WIR         0.23         \$0.00           CONSUMPTION         0.07         \$0.71           (LITERS)         0         \$0.07           43,946         0         0	0	\$0.00	\$78.16	\$418.80
0         \$0.00         \$0.00           0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WTR         0.23         \$0.00           CONSUMPTION         0.07         \$0.71           (LITERS)         0.07         \$0.71           43,946         0         0         \$0.71	0		\$0.00	\$0.00
0         \$0.00         \$0.00           0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           d ST ANNUAL         0         \$0.00         \$0.00           HOT WTR         0.23         \$0.00         \$0.71           CONSUMPTION         0.07         \$0.71         \$0.71           43,946         43,946         \$0.00         \$0.00         \$0.00		\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         0         \$0.00           EST ANNUAL         0         \$0.00           HOT WTR         0.23         \$0.00           CONSUMPTION         0.23         \$2.42           (LITERS)         0.07         \$0.71           43,946         0.07         \$0.07	0	\$0.00	\$0.00	\$0.00
ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           est Annual         0         \$0.00         \$0.00           HOT WTR         0.23         \$2.42           CONSUMPTION         0.07         \$0.71           43,946         0         \$0.07         \$0.71	0	\$0.00	\$0.00	\$0.00
ds         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           EST ANNUAL         0.23         \$0.00         \$0.23           HOT WTR         0.23         \$2.42           CONSUMPTION         0.07         \$0.71           43,946         43,946	0 0	\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00           0         0         \$0.00           EST ANNUAL         0.23         \$0.00           HOT WTR         0.23         \$2.42           CONSUMPTION         0.07         \$0.71           (LITERS)         \$0.71         \$0.71           43,946         \$0.77         \$0.77	0 0	\$0.00	\$0.00	\$0.00
0         0         \$0.00         \$0.00           EST ANNUAL         0.23         \$2.42           HOT WTR         0.07         \$0.71           CONSUMPTION         0.07         \$0.71           (LITERS)         \$0.71           43,946         \$0.71	0 0	\$0.00	\$0.00	\$0.00
EST ANNUAL       0.23       \$2.42         HOT WTR       0.07       \$0.71         CONSUMPTION       0.07       \$0.71         (LITERS)       43,946	0 0 0 0	\$0.00	\$0.00	\$0.00
CONSUMPTION 0.07 \$2.42 (LITERS) \$0.71	EST ANNUAL HOT WITE		£2.42	44000
CONSUMPTION \$0.71 (LITERS) \$43,946			\$2.42	\$10.00
43,946	CONSUMPTION		\$0.71	\$60.00
43 946	0			

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT	. KN	. KNOX WAT CONSERVATION STUDY	S NO	TUDY		10
	CALC	SULAT	X			DATE:	5 OCT 94
FACILITY NO.:	450 A&B		FUNCTION:	1.	UNACCOM PERS HOUS	A PERS	HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:	1	24 24	N 86 TO	\$
ECO Number	Existing Fixture System	PM	Retrofited Fixture System	n Dd	Usage HRS/YR	Fixtures Quantity	Water Leaks
1 materials	SINK W/ AERATOR	9.5	NO RETROFIT	9.5	125	2	
Lavatory Silins							
ECO1 TOTAL:		LPM		LPM		2	0
Wine Sinker	KITCHEN SINK	9.5	NO RETROFIT	9.5	365		0
MISC. SINKS	SERVICE SIINK	1.77	INO I ALL AERA I OR	6.0	00	-	
ECO2 TOTAL:		LPF		LPF	#FL/YR	2	0
3	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	14600	1	the second secon
Water Closets							
FCO3 TOTAL		L PF		LPF	#FL/YR	-	0
Urinals							
							c
ECO4 TOTAL:		LPM		LPM	HRS/YR	0	0
Shower Heads	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.5	245	-	0
Ollower Heads							
ECO5 TOTAL:		TEMP		TEMP		1	0
9	40 GAL REPUBLIC #406						
Water		325	REDUCE STORAGE TEMP	322	8760		
(GAS)	RECOVERT: 32 GALTIN		INSTALL INSUL JACKET	377	0070	-	
(25)							
ECO6 TOTAL:				1. Jak.	a Sign States	1	0
CVCTENAC	000		L				
STSTEMS CORP	לאט. האטי	Systei	Systems Engineering and Management Corporation,	nent C	orporatior		Knoxville, IN

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT. KNOX	T. KNO		WATER CONS	RVATION STUDY	TUDY	2 OF 2
		CA	LCULAT	OM NOI	Y		
FACILITY NO. :	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
450 A&B	Gas Rate:	10.51	\$/MWH		Demand Rate:		%/KW
ECO Number	Annual Water	Annual	Annual Energy	Saving	WATER	Total	Total
ECO Type	Saving LPY	ELEC		GAS MWH	Dollar Saving	Dollar Saving	Dollars Invested
1	0			0	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks	47,520			_	\$0.20	\$8.83	\$9.70
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	47,520	0	0	1	\$0.20	\$8.83	\$9.70
3	188,340				\$78.16	\$78.16	\$418.80
Water Closets	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$418.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
5	0			0	\$0.00	\$0.00	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
9	EST ANNUAL						
Water	HOT WTR			0.23		\$2.42	\$16.80
Heater	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS)						
	43,946						
ECO6 TOTAL:	43,946	0	0	8	\$0.00	\$83.38	\$76.80
SYSTEMS C	CORP			Systems	s Engineering an	d Management Cor	Systems Engineering and Management Corporation, Knoxville, TN

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT. KNOX WAT	T. KN	OX WAT CONSERVATION STUDY	S NOI	TUDY		10
	CAL	CULA	¥			DATE:	5 OCT 94
FACILITY NO.:	1426 A&B		FUNCTION:	— <sub>I</sub> ,	UNACCO	M PERS	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:	1	24	P .	0
ECO Number	Existing Fixture System		Retrofited Fixture System	٤	Usage	Fixtures	Water Leaks
ECO Type	Description	LPM	Description	LPM	HRS/YR	Quantity	Eliminated LPY
1 I avafory Sinke	SINK W/ AERATOR	9.5	NO RETROFIT	9.2	125	~	
Lavatoly office							
ECO1 TOTAL:		LPM		LPM		1	0
2	KITCHEN SINK	9.5	NO RETROFIT	9.5	365	-	0
Misc. Sinks	SERVICE SINK	22.7	INSTALL AERATOR	9.5	09	-	
				1		,	
ECO2 TOTAL:		LPF		LPF	#FL/YR	7	0
3	TANK TYPE	19		6.1	7300	2	
Water Closets	FLUSH TYPE	17	3.5 GPF REPAIR KIT	13.2	14600	-	
ECO3 TOTAL:		LPF		LPF	#FL/YR	8	0
1 Irinals							
OFFIGER							
ECO4 TOTAL:		LPM		LPM	HRS/YR	0	0
5	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.2	245	1	0
Shower Heads							
FCO5 TOTAL		TEMP		TEMP	181	-	0
9	40 GAL RIJID						
Water	CAPACITY: ?	334	REDUCE STORAGE TEMP	322	8760	1	
Heater	RECOVERY: ?		INSTALL INSUL JACKET	322	8760	1	
(GAS)							
ECO6 TOTAL:				. 3.5 V3 2.5		-	0

Systems Engineering and Management Corporation, Knoxville, TN **SYSTEMS CORP** 

	FY94S EEAP F	T. KNO	X WATE	R CON	FY94S EEAP FT. KNOX WATER CONSTRATION STUDY	TUDY	2 OF 2
		C	LCULAT	IOM NOI	ALCULATION WORK SHEET 2		
FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
287 284	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
ECO Number	Annual Water	Annual	Energy 8	Saving	WATER	Total	Total
ECO Type	Saving LPY	ELEC	ELEC	GAS	Dollar Saving	Dollar Saving	Dollars Invested
. 1	0			0	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks	47,520			-	\$0.20	\$8.83	\$9.70
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	47,520	0	0	1	\$0.20	\$8.83	\$9.70
3	188,340				\$78.16	\$78.16	\$838.80
Water Closets	55,480				\$23.02	\$23.02	\$60.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL:	243,820				\$101.19	\$101.19	\$898.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
5	0			0	\$0.00	\$0.00	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
9	EST ANNUAL						
Water	HOT WTR			0.89		\$9.37	\$16.80
Heater	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS)						
	43,946						
ECO6 TOTAL:	43,946	0	0	6	\$0.00	\$90.33	\$76.80

Systems Engineering and Management Corporation, Knoxville, TN

SYSTEMS CORP

PACILITY NO.:   1432 A   PUNCTION:   PUN	FACILITY NO.   1432 A   FUNCTION:   TAGE	Main color   Mai		こし していじ りきのこし		TOTO NOTE A VOICE OF TOTAL AND	)	)		
PACILITY NO.   1432A   PUNCTION:   TYPICAL OF 68 UNITS   PUNCCUPANCY	PACILITY NO.   1432 A	PACILITY NO.   1432 A   FUNCTION:   TYPICAL OF 68 UNITS		CAL		スS			DATE:	5 OCT 94
COORDINGS   EAMILY   Operating Hours: 17th Carl Of So UN	COUNTRY	COORDINATE   Existing Fixture System   Coordinated Fixture System   Coordinated Fixture System   Coordinated Fixture System   Coordinated Fixture Systems	FACILITY NO.:	1432 A	1	FUNCTION:		UNACCON	M PERS	DET
ECO Number   Existing Fixture System   Retrofited Fixture System   Usage Fixtures   ECO Number   Description   LPM   HRS/RR Quantity	ECO Number         Existing Fixture System         Retrofited Fixture System         Usage Prxtures Evitating Fixtures           ECO Type         Description         1-PM         HRS/YR Quantity           1 Lavatory Sinks         ECO1 TOTAL:         LPM         LPM         LPM         2           ECO1 TOTAL:         KITCHEN SINK         9.5 NO RETROFIT         9.5 365         1           Misc. Sinks         ECO2 TOTAL:         LPF         HFL/YR         1           Water Closeis         TANK TYPE         19 1.6 GPF TANK TYPE TOILET         6.1 14600         1           Water Closeis         ECO3 TOTAL:         LPF         HFL/YR         1           ECO4 TOTAL:         LPM         NO RETROFIT         10 14600         1           ECO4 TOTAL:         ECO4 TOTAL:         LPM         HRS/YR         0           ECO5 TOTAL:         CAPACITY:         1 14600         1           Shower Heads         ECO5 TOTAL:         LPM         HRS/YR         0           ECO5 TOTAL:         CAPACITY:??         331 REDUCE STORAGE TEMP         322 8760         1           Heater         RECOFORNY:???         INSTALL INSUL JACKET         322 8760         1           GASSIEMS         INSTALL INSUL JACKET         322 8760 <td>  ECO Number   Existing Fixture System   Retrofited Fixture System   LPM   HRS/YR Quantity    </td> <td>Occupancy:</td> <td>FAMILY</td> <td>ı</td> <td>Operating Hours:</td> <td></td> <td>1 r PICAL 24</td> <td>0 20 .</td> <td>0</td>	ECO Number   Existing Fixture System   Retrofited Fixture System   LPM   HRS/YR Quantity	Occupancy:	FAMILY	ı	Operating Hours:		1 r PICAL 24	0 20 .	0
ECO Type         Description         LPM         Description         LPM HRS/YR Quantity           Lavatory Sinks         Lavatory Sinks         9.5 NO RETROFIT         9.5 125         2           ECOT TOTAL:         KITCHEN SINK         9.5 NO RETROFIT         LPM         2           Misc. Sinks         LPF         NO RETROFIT         9.5 365         1           ECOZ TOTAL:         LPF         LPF         #FL/YR         1           ECO3 TOTAL:         LPF         LPF         #FL/YR         1           ECO4 TOTAL:         LPM         HRS/YR         0         1           ECO4 TOTAL:         LPM         HRS/YR         0         1           ECO5 TOTAL:         TEMP         HRS/YR         0 <t< td=""><td>ECO Type         Description         LPM         Description         LPM         HRS/YR         Quantity           Lavatory Sinks         ECO1 TOTAL:         LPM         9.5 NO RETROFIT         LPM         2           ECO2 TOTAL:         A         19 Is GPF TANK TYPE TOILET         LPF         #FL/YR         1           ECO3 TOTAL:         A         LPF         #FL/YR         1           ECO3 TOTAL:         LPF         HEL/YR         1           ECO4 TOTAL:         LPF         HEL/YR         1           Water Closets         LPF         HEL/YR         1           ECO4 TOTAL:         LPF         HEL/YR         1           Shower Heads         ECO5 TOTAL:         B         NO RETROFIT         9:5 245         1           ECO5 TOTAL:         CAPACITY: ?         1         HEMP         TEMP         1           ECO5 TOTAL:         ECO5 TOTAL:         B         NO RETROFIT         9:5 245         1           FCO5 TOTAL:         TEMP         TEMP         TEMP         TEMP         1           FCO5 TOTAL:         RECOVERY: ?         NO RETROFIT         322 8760         1           Heater         RECOFICE STORAGE TEMP         322 8760         1<td>ECO Type         Description         LPM         Description         LPM         HRS/NR Quantity           Lavatory Sinks         SINK W/ AERATOR         9.5 NO RETROFIT         1.6         2         2           ECO1 TOTAL:         LPM         LPM         SS         3         3           ECO2 TOTAL:         LPF         LPF         LPF         LPF         4           ECO2 TOTAL:         LPF         LPF         LPF         LPF         HFL/YR         1           Water Closets         TANK TYPE         19         1.6 GPF TANK TYPE TOILET         6.1         14600         1           Urinals         FCO3 TOTAL:         LPF         LPF         HFL/YR         1           ECO4 TOTAL:         LPF         LPF         HFL/YR         1           ECO4 TOTAL:         LPF         LPM         HRS/YR:         0           ECO5 TOTAL:         LPM         HRS/YR:         0         1           ECO5 TOTAL:         TEMP         A0 GAL RUUD         1         1           Water         CAPACITY: ?         A0 GAL RUUD         1         1           ECO5 TOTAL:         ECO6 TOTAL:         1         1         1           ECO6 TOTAL:         <t< td=""><td>ECO Number</td><td>Existing Fixture Systen</td><td>u</td><td>Retrofited Fixture Syste</td><td>m</td><td>Usage</td><td>Fixtures</td><td>Water Leaks</td></t<></td></td></t<>	ECO Type         Description         LPM         Description         LPM         HRS/YR         Quantity           Lavatory Sinks         ECO1 TOTAL:         LPM         9.5 NO RETROFIT         LPM         2           ECO2 TOTAL:         A         19 Is GPF TANK TYPE TOILET         LPF         #FL/YR         1           ECO3 TOTAL:         A         LPF         #FL/YR         1           ECO3 TOTAL:         LPF         HEL/YR         1           ECO4 TOTAL:         LPF         HEL/YR         1           Water Closets         LPF         HEL/YR         1           ECO4 TOTAL:         LPF         HEL/YR         1           Shower Heads         ECO5 TOTAL:         B         NO RETROFIT         9:5 245         1           ECO5 TOTAL:         CAPACITY: ?         1         HEMP         TEMP         1           ECO5 TOTAL:         ECO5 TOTAL:         B         NO RETROFIT         9:5 245         1           FCO5 TOTAL:         TEMP         TEMP         TEMP         TEMP         1           FCO5 TOTAL:         RECOVERY: ?         NO RETROFIT         322 8760         1           Heater         RECOFICE STORAGE TEMP         322 8760         1 <td>ECO Type         Description         LPM         Description         LPM         HRS/NR Quantity           Lavatory Sinks         SINK W/ AERATOR         9.5 NO RETROFIT         1.6         2         2           ECO1 TOTAL:         LPM         LPM         SS         3         3           ECO2 TOTAL:         LPF         LPF         LPF         LPF         4           ECO2 TOTAL:         LPF         LPF         LPF         LPF         HFL/YR         1           Water Closets         TANK TYPE         19         1.6 GPF TANK TYPE TOILET         6.1         14600         1           Urinals         FCO3 TOTAL:         LPF         LPF         HFL/YR         1           ECO4 TOTAL:         LPF         LPF         HFL/YR         1           ECO4 TOTAL:         LPF         LPM         HRS/YR:         0           ECO5 TOTAL:         LPM         HRS/YR:         0         1           ECO5 TOTAL:         TEMP         A0 GAL RUUD         1         1           Water         CAPACITY: ?         A0 GAL RUUD         1         1           ECO5 TOTAL:         ECO6 TOTAL:         1         1         1           ECO6 TOTAL:         <t< td=""><td>ECO Number</td><td>Existing Fixture Systen</td><td>u</td><td>Retrofited Fixture Syste</td><td>m</td><td>Usage</td><td>Fixtures</td><td>Water Leaks</td></t<></td>	ECO Type         Description         LPM         Description         LPM         HRS/NR Quantity           Lavatory Sinks         SINK W/ AERATOR         9.5 NO RETROFIT         1.6         2         2           ECO1 TOTAL:         LPM         LPM         SS         3         3           ECO2 TOTAL:         LPF         LPF         LPF         LPF         4           ECO2 TOTAL:         LPF         LPF         LPF         LPF         HFL/YR         1           Water Closets         TANK TYPE         19         1.6 GPF TANK TYPE TOILET         6.1         14600         1           Urinals         FCO3 TOTAL:         LPF         LPF         HFL/YR         1           ECO4 TOTAL:         LPF         LPF         HFL/YR         1           ECO4 TOTAL:         LPF         LPM         HRS/YR:         0           ECO5 TOTAL:         LPM         HRS/YR:         0         1           ECO5 TOTAL:         TEMP         A0 GAL RUUD         1         1           Water         CAPACITY: ?         A0 GAL RUUD         1         1           ECO5 TOTAL:         ECO6 TOTAL:         1         1         1           ECO6 TOTAL: <t< td=""><td>ECO Number</td><td>Existing Fixture Systen</td><td>u</td><td>Retrofited Fixture Syste</td><td>m</td><td>Usage</td><td>Fixtures</td><td>Water Leaks</td></t<>	ECO Number	Existing Fixture Systen	u	Retrofited Fixture Syste	m	Usage	Fixtures	Water Leaks
SINK W/ AERATOR   9.5   NO RETROFIT   9.5   125   2	Tank W AERATOR   9.5   NO RETROFIT   9.5   125   2	SINK W/ AERATOR   9.5   NO RETROFIT   9.5   125   2	ECO Type			Description		HRS/YR	Quantity	Eliminated LP
ECOT TOTAL:	Lavatory Sinks	Lavatory Sinks	1	SINK W/ AERATOR	9.5	NO RETROFIT	9.5	125	2	
ECOT TOTAL:	ECOT TOTAL:	ECOT TOTAL:	Lavatory Sinks							
Misc. Sinks	Misc. Sinks   9.5 NO RETROFIT   9.5 365   1	Misc. Sinks   9.5 NO RETROFIT   9.5 365   1	FCO1 TOTAL:		Md		PM		2	C
Misc. Sinks   ECO2 TOTAL:	Misc. Sinks   ECOZ TOTAL:   3	Misc. Sinks	2		9.5	NO RETROFIT	9.5	365	1	0
ECO2 TOTAL: 3   TANK TYPE   19   1.6 GPF TANK TYPE TOILET   6.1   14600   1   146000   1   14600   1   14600   1   14600   1   14600   1   14600   1   14600   1	ECO2 TOTAL: 3	ECO2 TOTAL: 3	Misc. Sinks							
3   TANK TYPE   19   1.6 GPF TANK TYPE TOILET   6.1   14600   1	3   TANK TYPE   19   1.6 GPF TANK TYPE TOILET   6.1   14600   1	3 TANK TYPE 19 1.6 GPF TANK TYPE TOILET 6.1 14600 1 Water Closets  ECO3 TOTAL: 4 Urinals  ECO4 TOTAL: 5 Shower Heads ECO5 TOTAL: 6 Water CAPACITY: ? INSTALL INSUL JACKET 322 8760 1 Heater RECOVERY: ? INSTALL INSUL JACKET 322 8760 1 ECO5 TOTAL: 6 Water CAPACITY: ? INSTALL INSUL JACKET 322 8760 1 ECO6 TOTAL: CGAS)  ECO6 TOTAL: CGAS  ECO6 TOTAL: A 10 GAL RUUD Water CAPACITY: ? INSTALL INSUL JACKET 322 8760 1 ECO6 TOTAL: CGAS  ECO6 TOTAL: A 10 GAL RUUD Water CAPACITY: ? INSTALL INSUL JACKET 322 8760 1 ECO6 TOTAL: A 10 GAL RUUD Water CAPACITY: ? INSTALL INSUL JACKET 322 8760 1  ECO6 TOTAL: A 10 GAL RUUD Water CAPACITY: A 10 GAL RUUD WATER CAPACITY A 10 GAL RUUD WATER	ECO2 TOTAL:		LPF		LPF	#FL/YR	1	0
Water Closets	Water Closets         LPF         #FL/YR         1           ECO3 TOTAL:         LPM         LPM         HRS/YR         0           Urinals         ECO4 TOTAL:         LPM         HRS/YR         0           ECO4 TOTAL:         LPM         LPM         HRS/YR         0           Shower Heads         RESIDENTIAL TYPE         9.5         245         1           Shower Heads         TEMP         TEMP         1         1           ECO5 TOTAL:         TEMP         TEMP         1         1           Water         CAPACITY: ?         331         REDUCE STORAGE TEMP         322         8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322         8760         1           GAS)         (GAS)         RECOF TOTAL:         1         1           ECO6 TOTAL:         RECOVERY: ?         NATEL INSUL JACKET         322         8760         1           ECO6 TOTAL:         RECOVERY: ?         RECOVERY: RECOVERY: ?         RECOVERY:	Water Closets         LPF         LPF         #FL/YR         1           ECO3 TOTAL: 4 Uninals         LPM         LPM         HRS/YR         0           ECO4 TOTAL: 5 Shower Heads 5 Shower Heads 6 Gos TOTAL: 6 degree TOTAL: 6 degree TOTAL: 7 Shower Heads 7 Shower Heads 7 Shower Heads 6 do GAL RUUD 7 Shower Heads 6 do GAL RUUD 7 Shower Heads 7 Shower Heads 7 Shower Heads 7 Shower Heads 8 Shower GAPACITY: 7 Shower Header 8 Shower GAPACITY: 7 Shower Header 8 Shower GASI 8 Shower Sho	3	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	14600	-	
CCO3 TOTAL :	ECO3 TOTAL:         LPF         LPF         #FL/YR         1           4         4         Urinals         LPM         LPM         LPM         HRS/YR         0           ECO4 TOTAL:         5         RESIDENTIAL TYPE         9.5         NO RETROFIT         9.5         245         1           Shower Heads         ECO5 TOTAL:         TEMP         TEMP         1         1           ECO5 TOTAL:         6         40 GAL RUUD         33.1         REDUCE STORAGE TEMP         322         8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322         8760         1           ECO6 TOTAL:         CAPACITY: ?         INSTALL INSUL JACKET         322         8760         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, T	CO3 TOTAL:	Water Closets							
A	Urinals	Urinals			I PF		I PF	#FI //R	-	O
Urinals	Urinals         LPM         LPM         HRS/YR         0           ECO4 TOTAL:         5         RESIDENTIAL TYPE         9.5         NO RETROFIT         9.5         245         1           Shower Heads         ECO5 TOTAL:         TEMP         1         1         1           ECO5 TOTAL:         6         40 GAL RUUD         331 REDUCE STORAGE TEMP         322 8760         1           Water         CAPACITY:         7         1         1           (GAS)         INSTALL INSUL JACKET         322 8760         1           ECO6 TOTAL:         INSTALL INSUL JACKET         322 8760         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, T	Urinals								
ECO4 TOTAL	ECO4 TOTAL:         LPM         HRS/YR         0           Shower Heads         RESIDENTIAL TYPE         9.5         NO RETROFIT         9.5         245         1           ECO5 TOTAL:         TEMP         TEMP         TEMP         1         1           ECO5 TOTAL:         GA 40 GAL RUUDD         TEMP         TEMP         1         1           Water         CAPACITY:         331         REDUCE STORAGE TEMP         322         8760         1           Heater         RECOVERY:         NSTALL INSUL JACKET         322         8760         1           GAS)         ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, T	ECO4 TOTAL:         LPM         HRS/YR         0           Shower Heads         RESIDENTIAL TYPE         9.5         NO RETROFIT         9.5         245         1           Shower Heads         TEMP         TEMP         TEMP         1         1           ECO5 TOTAL:         TEMP         TEMP         1         1           Water         CAPACITY:         331         REDUCE STORAGE TEMP         322         8760         1           Heater         RECOVERY:         1         1         1         1           GAS)         INSTALL INSUL JACKET         322         8760         1           ECO6 TOTAL:         INSTALL INSUL JACKET         322         8760         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, T	Urinals							
5 No RETROFIT         9.5         245         1           Shower Heads         Shower Heads         9.5         245         1           ECO5 TOTAL:         TEMP         TEMP         7         1           ECO5 TOTAL:         An GAL RUUD         1         1         1           Water         CAPACITY:         331         REDUCE STORAGE TEMP         322         8760         1           Heater         RECOVERY:         NINSTALL INSUL JACKET         322         8760         1           ECO6 TOTAL:         CORPACITY:         Customs Engineering and Management Corpus         1	5         RESIDENTIAL TYPE         9.5         NO RETROFIT         9.5         245         1           Shower Heads         CAPACITY:         TEMP         TEMP         TEMP         1           ECO5 TOTAL:         An GAL RUUD         1         1         1           Water         CAPACITY:         331         REDUCE STORAGE TEMP         322         8760         1           Heater         RECOVERY:         NSTALL INSUL JACKET         322         8760         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, T	5         RESIDENTIAL TYPE         9.5         NO RETROFIT         9.5         245         1           Shower Heads         ECO5 TOTAL:         TEMP         TEMP         1           ECO5 TOTAL:         A0 GAL RUUD         331 REDUCE STORAGE TEMP         322 8760         1           Heater         RECOVERY:         3 INSTALL INSUL JACKET         322 8760         1           (GAS)         INSTALL INSUL JACKET         322 8760         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, T	ECO4 TOTAL:		L PM		LPM			0
Shower Heads         TEMP         TEMP         1           ECO5 TOTAL :         6         40 GAL RUUD         1           Water         CAPACITY: ?         331 REDUCE STORAGE TEMP         322 8760 1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322 8760 1           (GAS)         ECO6 TOTAL :         1	Shower Heads         Shower Heads         TEMP         TEMP         1           ECO5 TOTAL:         40 GAL RUUD         1         1           Water         CAPACITY: ?         331 REDUCE STORAGE TEMP         322 8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322 8760         1           (GAS)         ECO6 TOTAL:         1         1           SYSTEMS CORP         Systems Engineering and Management Corporation, Knoxville, T	Shower Heads         TEMP         TEMP         1           ECO5 TOTAL:         40 GAL RUUD         1         1           Water         CAPACITY: ?         331 REDUCE STORAGE TEMP         322 8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322 8760         1           (GAS)         ECO6 TOTAL:         1         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, T	5	1 .	9.5	NO RETROFIT	9.5			55640
ECO5 TOTAL :	ECO5 TOTAL:TEMPTEMP1640 GAL RUUD331 REDUCE STORAGE TEMP322 87601HeaterRECOVERY: ?INSTALL INSUL JACKET322 87601(GAS)ECO6 TOTAL:1  Systems Engineering and Management Corporation, Knoxville, T	ECOS TOTAL:TEMPTEMP1640 GAL RUUD331 REDUCE STORAGE TEMP322 8760 1HeaterRECOVERY: ?INSTALL INSUL JACKET322 8760 1(GAS)ECO6 TOTAL:1 ECO6 TOTAL: Systems Engineering and Management Corporation, Knoxville, T	Shower Heads							
REDUCE STORAGE TEMP   322   8760   1	HOUD  SITY: ?  Systems Engineering and Management Corporation, Knoxville, T	RUUD  SITY: ?  331 REDUCE STORAGE TEMP 322 8760 1  INSTALL INSUL JACKET 322 8760 1  INSTALL INSUL JACKET 322 8760 1  Systems Engineering and Management Corporation, Knoxville, T			TEMP		TEMP		7	55640
Water         CAPACITY: ?         331 REDUCE STORAGE TEMP         322 8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322 8760         1           (GAS)         ECO6 TOTAL:         Account of the control o	WaterCAPACITY: ?331 REDUCE STORAGE TEMP322 87601HeaterRECOVERY: ?INSTALL INSUL JACKET322 87601(GAS)ECO6 TOTAL:1	Water       CAPACITY: ?       331       REDUCE STORAGE TEMP       322       8760       1         Heater       RECOVERY: ?       INSTALL INSUL JACKET       322       8760       1         (GAS)       ECO6 TOTAL:       1         ECO6 TOTAL:       Asstems Engineering and Management Corporation, Knoxville, TN	9	40 GAL RUUD						
Heater RECOVERY: ? INSTALL INSUL JACKET 322 8760 1  (GAS)  ECO6 TOTAL:	Heater       RECOVERY: ?       INSTALL INSUL JACKET       322       8760       1         (GAS)       ECO6 TOTAL:       Analysis of the component component of the component of	Heater       RECOVERY: ?       INSTALL INSUL JACKET       322       8760       1         (GAS)       ECO6 TOTAL:       1       1         SYSTEMS CORP       Systems Engineering and Management Corporation, Knoxville, TN	Water	CAPACITY: ?	331	REDUCE STORAGE TEMP	322	8760	-	
ECO6 TOTAL:  CVCTEMS CORP	(GAS)       1         ECO6 TOTAL:       1         Systems Engineering and Management Corporation, Knoxville, TN	ECO6 TOTAL:  Systems Engineering and Management Corporation, Knoxville, TN	Heater			INSTALL INSUL JACKET	322	8760	-	
SVSTEMS CORP	ECO6 TOTAL:  Systems Engineering and Management Corporation, Knoxville, TN	SYSTEMS CORP Systems Engineering and Management Corporation, Knoxville, TN	(GAS)							
SVSTEMS CORP	SYSTEMS CORP Systems Engineering and Management Corporation, Knoxville, TN	SYSTEMS CORP Systems Engineering and Management Corporation, Knoxville, TN	FCO6 TOTAL:						-	C
SVSTEMS CORP	SYSTEMS CORP Systems Engineering and Management Corporation,	SYSTEMS CORP Systems Engineering and Management Corporation,								
			SYSTEMS C	ORP	Sveter	ns Engineering and Manage	ment C	ornoration	1	NT elli

Systems Engineering and Management Corporation, Knoxville, TN

CALCULATION WORK SHEET 2   SMXH     Cas Rate:	CALCULATION WORK SHEET 2   CALCULATION WORK SHEET 2   CALCULATION WORK SHEET 2   S/KV   S/KL   Energy Rate: S/KV   S/KV   S/KV   S/KVKWH   S/KVK		FY94S EEAP FT. KNOX	T. KNO		WATER CON	RVATION STUDY	TUDY	2 OF 2
Cas Rate:         0.42         \$/KL         Energy Rate:         \$/KV           Gas Rate:         10.51         \$/MVMH         Demand Rate:         \$/KW           Per Annual Water         Annual Energy Saving         WATER         Total         \$/KW           Per Saving LPY         KW         KWM         MWH         Dollar Saving         \$/KW         \$/KWH         \$/KWH         Dollar Saving         \$/KW         \$/KWH         <	Cas Rate:   0.42   \$/KL			CA	LCULAT	ION WO	RK SHEET 2		
Gas Rate:         10.51         \$\text{NWW}\$         Demand Rate:         \$\text{KW}\$           O Type         Saving LPY         KW         KWH         MWH         Dollar Saving         Total           CO Type         Saving LPY         KW         KWH         MWH         Dollar Saving         \$\text{C}_{0.00}\$           TOTAL:         0         0         0         \$\text{C}_{0.00}\$         \$\text{S}_{0.00}\$           TOTAL:         0         0         0         \$\text{S}_{0.00}\$         \$\text{S}_{0.00}\$           Sc. Sinks         0         0         0         \$\text{S}_{0.00}\$         \$\text{S}_{0.00}\$           Sc. Sinks         0         0         0         \$\text{S}_{0.00}\$         \$\text{S}_{0.00}\$           TOTAL:         188,340         0         \$\text{S}_{0.00}\$         \$\text{S}_{0.00}\$         \$\text{S}_{0.00}\$           TOTAL:         0         0         0         \$\text{S}	Sas Rate: 10.51 \$/MWH	FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
O Number         Annual Water         Annual ELEC         ELEC         GAS         WATER         Total           20 Type         Saving         LEC         ELEC         GAS         S0.00         \$0.00           10 TotAL:         0         0         0         \$0.00         \$0.00           10 TotAL:         0         0         0         \$0.00         \$0.00           20 Sinks         0         0         0         \$0.00         \$0.00           20 Sinks         0         0         \$0.00         \$0.00         \$0.00           20 Sinks         0         0         \$0.00         \$0.00         \$0.00         \$0.00           20 Sinks         0         0         \$0.00	O Type         Saving LPY RW RWH           1 0         ELEC ELEC ELEC ELEC ELEC ELEC ELEC ELEC		Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
CO Type         Saving LPY         KWH         MWH         Dollar Saving \$0.00         Dollar Saving \$0.00           tory Sinks         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00           Sc. 640         0         \$0.00         \$0.00         \$0.00           TOTAL:         \$0.00         \$0.00         \$0.00         \$0.00           ESTANNUAL	CO Type   Saving LPY KW KWH   1	ECO Number	Annual Water	Annual		saving	WATER	Total	Total
tory Sinks         0         50.00         \$0.00           tory Sinks         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           sc. Sinks         0         \$0.00         \$0.00         \$0.00           TOTAL:         18B;340         0         \$0.00         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         55,640         0         0         \$0.00         \$0.00         \$0.00	1         0           tory Sinks         0           TOTAL:         0         0           sc. Sinks         0         0         0           TOTAL:         0         0         0           TOTAL:         0         0         0           TOTAL:         188,340         0         0           TOTAL:         0         0         0           TOTAL:         0         0         0           TOTAL:         55,640         0         0           E ST ANNUAL         0         0           6         EST ANNUAL         Heater         CONSUMPTION           (GAS)         (LITERS)         43,946         0         0           TOTAL:         43,946         0         0           TOTAL:         43,946         0         0           TOTAL:         43,946         0         0	ECO Type		ELEC		GAS	Dollar Saving	Dollar Saving	Dollars Invested
ttory Sinks         0         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         0         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         55,640         0         \$0.00         \$0.00         \$0.00         \$0.00           ESTANNUAL         0         \$0.00         \$0.00         \$0.00         \$0.00	tory Sinks 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1				0	\$0.00	\$0.00	\$0.00
TOTAL:         0         0         \$0.00         \$0.00           2. Indexten         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00           TOTAL:         0         0         0         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           TOTAL:         188,340         0         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00           Jrinals         0         \$0.00         \$0.00         \$0.00           Jrinals         0         \$0.00         \$0.00         \$0.00           So.640         \$0.00         \$0.00         \$0.00         \$0.00           So.640         \$0         \$0.00         \$0.00         \$0.00           TOTAL:         \$5,640         \$0         \$0.00         \$0.00         \$0.00           E         \$5,640         \$0         \$0.00         \$0.00         \$0.00         \$0.00           E         ESTANNUAL         \$0.00         \$0.00         \$0.00         \$0.00	TOTAL:         0         0         0           2         0         0         0           2         0         0         0           2         0         0         0           2         0         0         0           TOTAL:         188,340         0         0           TOTAL:         0         0         0           TOTAL:         0         0         0           F         55,640         0         0           GAS, Water         HOT WTR         Heater         CONSUMPTION           (GAS)         (LITERS)         43,946         0         0           TOTAL:         43,946         0         0         0           TOTAL:         43,946         0         0         0           TOTAL:         43,946 <td>Lavatory Sinks</td> <td>0</td> <td></td> <td></td> <td>0</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td>	Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
TOTAL:         0         0         0         \$0.00         \$0.00           2         0         0         \$0.00         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00         \$0.00           TOTAL:         0         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00         \$0.00           er Closets         0         0         \$0.00         \$0.00         \$0.00           er Closets         0         0         \$0.00         \$0.00         \$0.00           er Closets         0         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00         \$0.00           Jrinals         0         \$0.00         \$0.00         \$0.00         \$0.00           F         55,640         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           F         55,640         0         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         <	TOTAL:         0         0         0           2         0         0         0           sc. Sinks         0         0         0           TOTAL:         0         0         0           TOTAL:         188,340         0         0           TOTAL:         188,340         0         0           Jrinals         0         0         0         0           TOTAL:         0         0         0         0           wer Heads         0         0         0         0           F         55,640         0         0         0           G         EST ANNUAL         0         0         0           GASIA         (LITERS)         43,946         0         0           TOTAL:         43,946         0         0         0           TOTAL:         43,946         0         0         0		0			0	\$0.00	\$0.00	\$0.00
s         0         \$0.00         \$0.00           s         0         \$0.00         \$0.00           fts         0         0         \$0.00           fts         0         \$0.00         \$0.00           ft         0         \$0.00         \$0.00           ft         \$0.00         \$0.00         \$0.00           ft	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
s         0         \$0.00         \$0.00           st         0         0         \$0.00         \$0.00           tfs         0         0         \$0.00         \$0.00           tfs         0         0         \$0.00         \$0.00           tfs         0         \$0.00         \$0.00         \$0.00           tfs         \$0.00         \$0.00         \$0.00         \$0.00 <t< td=""><td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>2</td><td>0</td><td></td><td></td><td>0</td><td>\$0.00</td><td>\$0.00</td><td>\$0.00</td></t<>	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2	0			0	\$0.00	\$0.00	\$0.00
0         0         \$0.00         \$0.00           tfs         0         0         \$0.00         \$0.00           tfs         0         \$0.00         \$0.00         \$0.00           tfs         0         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00         \$0.00           55,640         0         \$0.00         \$0.00         \$0.00           55,640         0         \$0.00         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00         \$0.00           HOT WIR         0.68         \$23.09         \$1,034.18         \$0.00           CONSUMPTION         7.70         \$0.00         \$0.00         \$0.00           43,946         0         80.00         \$0.00         \$0.00           43,946         0         80.00         \$0.00         \$0.00           80.00         \$0.00         \$0.00         \$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
observed         \$0.00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0			0	\$0.00	\$0.00	\$0.00
its         \$78.16         \$78.16           its         0         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           55,640         \$0         \$0.00         \$0.00           45,640         0         \$0.00         \$0.00           55,640         \$0         \$0.00         \$0.00           EST ANNUAL         \$0.00         \$0.00         \$0.00           HOT WIR         0.68         \$23.09         \$1,034.18           CONSUMPTION         7.70         \$80.96           43,946         0         \$6.00         \$80.90           43,946         0         \$6.00         \$88.07	88,340 0 0 0 0 0 0 0 0 0 0 0 0 0	ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
tfs         0         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           55,640         \$0         \$0.00         \$0.00           ds         \$0         \$0.00         \$0.00           EST ANNUAL         \$0.08         \$23.09         \$1,034.18           HOT WTR         \$0.68         \$23.09         \$1,034.18           CONSUMPTION         7.70         \$60.00         \$80.96           (LITERS)         7.70         \$80.96           43,946         0         8         \$0.00         \$88.07	0 0 0 0 0 0 5,640 0 0 0 0 0 5,640 0 0 0 0 0 0 0 0 0 0 0 1,040 0 0 0 0 0 1,040 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	က	188,340				\$78.16	\$78.16	\$418.80
0         \$0.00         \$0.00           188,340         \$78.16         \$78.16           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           55,640         96         \$23.09         \$1,034.18           ds         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WTR         0.68         \$23.09         \$1,034.18           CONSUMPTION         7.70         \$80.96           (LITERS)         7.70         \$80.96           43,946         0         8         \$6.00           43,946         0         8         \$6.00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Water Closets	0				\$0.00	\$0.00	\$0.00
188,340         \$78.16         \$78.16           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           55,640         96         \$23.09         \$1,034.18           4s         0         0         \$0.00         \$0.00           EST ANNUAL         0         96         \$23.09         \$1,034.18         \$0.00           HOT WTR         0.68         \$23.09         \$1,034.18         \$7.11         \$43.946         \$6.00 <td>18,340 0 0 0 0 5,640 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0</td> <td></td> <td>0</td> <td></td> <td></td> <td></td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td>	18,340 0 0 0 0 5,640 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0		0				\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00           0         \$0.00         \$0.00           55,640         96         \$23.09         \$0.00           4st,640         0         96         \$23.09         \$1,034.18           1         55,640         0         96         \$23.09         \$1,034.18           1         55,640         0         96         \$23.09         \$0.00           1         55,640         0         96         \$23.09         \$0.00           1         EST ANINUAL         0.68         \$1,034.18         1034.18           2         HOT WITR         0.68         \$7.11         \$7.70         \$80.96           2         43,946         0         8         \$0.00         \$88.07           3         43,946         0         8         \$0.00         \$88.07	0 0 0 5,640 0 0 0 0 5,640 0 0 5,640 0 0 0 0 0 0 0 0 0 1,040 0 0 0 3,946 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$418.80
0         \$0.00         \$0.00           0         \$0.00         \$0.00           4cs         \$0.00         \$0.00           4cs         \$0.00         \$0.00           4cs         \$0.00         \$0.00           4cs         \$0.00         \$0.00           55,640         0         \$0.00         \$0.00           55,640         0         \$0.00         \$0.00           EST ANNUAL         0.68         \$1,034.18           HOT WTR         0.68         \$23.09         \$1,034.18           CONSUMPTION         7.70         \$80.96           (LITERS)         7.70         \$80.96           43,946         0         8         \$0.00         \$88.07	0 0 0 0 0 0 0 5,640 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	4	0				\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00           55,640         \$0.00         \$0.00         \$0.00           3ds         0         \$0.00         \$1,034.18         \$0.00           1         55,640         0         0         \$0.00         \$0.00         \$0.00         \$0.00           1         55,640         0         0         \$0.00	0 0 0 0 0 0 0 4NNUAL 0 0 0 5,640 0 0 ANNUAL 0 TERS) 17ERS) 3,946 0 0	Urinals	0				\$0.00	\$0.00	\$0.00
:         0         \$0.00         \$0.00           ads         55,640         96         \$23.09         \$1,034.18           ids         0         \$0.00         \$0.00         \$0.00           :         55,640         0         96         \$23.09         \$1,034.18         \$0.00           :         55,640         0         96         \$23.09         \$1,034.18         \$0.00           :         FST ANNUAL         0.68         \$23.09         \$1,034.18         \$0.00           HOT WIR         7.70         \$80.96         \$20.00           CONSUMPTION         7.70         \$80.96         \$43,946         \$0         8         \$0.00         \$88.07	5,640 0 0 0 5,640 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0		0				\$0.00	\$0.00	\$0.00
ads         55,640         96         \$23.09         \$1,034.18           ads         0         \$0.00         \$0.00         \$0.00           :         55,640         0         96         \$23.09         \$1,034.18         \$0.00           EST ANNUAL         0.68         \$23.09         \$1,034.18         \$0.00         \$0.06           HOT WITR         0.68         \$7.11         \$80.96         \$2.00         \$80.96           CONSUMPTION         7.70         \$80.96         \$80.96         \$43,946         \$0         8         \$0.00         \$88.07	5,640 0 0 5,640 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
ads         0         \$0.00	0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 3,946 0 0	2	55,640			96	\$23.09	\$1,034.18	\$0.00
0         \$0.00         \$0.00         \$0.00           55,640         0         96         \$23.09         \$1,034.18           EST ANNUAL         0.68         \$7.11         \$7.70         \$80.96           CONSUMPTION         7.70         \$80.96         \$43,946         \$6.00         \$888.07	0 5,640 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	Shower Heads	0			0	\$0.00	\$0.00	\$0.00
55,640         0         96         \$23.09         \$1,034.18           EST ANNUAL         0.68         \$7.11           HOT WTR         0.68         \$7.11           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         8           *88.07         \$88.07	5,640 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0		0			0	\$0.00	\$0.00	\$0.00
EST ANNUAL         0.68         \$7.11           HOT WTR         0.68         \$7.11           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         8         \$0.00         \$888.07	ANNUAL  JT WTR  SUMPTION  TERS)  3,946  3,946  0  0	ECO5 TOTAL:	55,640	0	0	96	\$23.09	\$1,034.18	\$0.00
CONSUMPTION 7.70 \$80.96 (LITERS) 43,946 0 0 8 \$0.00 \$88.07	3,946 0 0	Water	EST ANNUAL HOT WITE			0.68		\$7.11	
(LITERS) 43,946 0 0 8 \$0.00 \$88.07	3,946 0 0	Heater	CONSUMPTION			7.70		\$80.96	\$60.00
43,946 0 0 8 \$0.00 \$88.07	3,946 0 0	(GAS)	(LITERS) 43.946						
		ECO6 TOTAL:	43,946	0	0	8	\$0.00	\$88.07	\$60.00
		E 3 -2							

Systems Engineering and Management Corporation, Knoxville, TN

CALCULATION WORK SHEET 1   DATE: 6 C	FACILITY NO.   4041   PATE:   FUNCTION:   TOTAL ORDERS HEET   PACILITY NO.   4041   PATE:   PACILITY NO.   4041   PATE:   PACILITY NO.   4041   PATE:   PATE		FY94S EEAP FT		KNOX WATE CONSERVATION STUDY	NOI.	TUDY		10,
SINK W/ AERATOR   Substitute System   Care of the control of the	FACILITY NO.   4041   FUNCTION:   FUNCTION:   FUNCTION:   FAMILY   PUNCTION:   TYPICAL OF 10 UNITS   Cocupancy;   EAMILY   Description   LPM   Retrolited Fixture System   LPM   Retrolited Fixture Systems   LPM   Retrolited Fixture Sys		CAL		ION WORK SHEET 1			DATE:	5 OCT 94
FAMILY   Operating Hours:	COUNTRY   Existing Fixture System   Country   Existing Fixture System   Country   Co	FACILITY NO.:	4041	,	FUNCTION:		UNACCOI	M PERS	S
Existing Fixture System   Retrofited Fixture System   Usage   Fixtures	ECO Number   Existing Fixture System   Retrofited Fixture System   LPM   Description   LPM   HRS/YR Quantity	Occupancy:	FAMILY	ı	Operating Hours:	,	1 Y PICAL 24	10 U	Ω 
SINK W/ AERATOR         LPM         Description         LPM         HRS/YR         Quantity           SINK W/ AERATOR         9.5         NO RETROFIT         9.5         125         1           KITCHEN SINK         9.5         NO RETROFIT         9.5         365         2           TANK TYPE         19         1.6 GPF TANK TYPE TOILET         6.1         4600         1           S         RESIDENTIAL TYPE         5.68         NO RETROFIT         5.68         245         1           A0 GAL ? GLO 850         TEMP         TEMP         TEMP         1         1           RECOVERY: 25.6 GAL/H         NSTALL INSUL JACKET TEMP         322         8760         1           RECOVERY: 25.6 GAL/H         NSTALL INSUL JACKET         322         8760         1	ECO Type         Description         LPM         Description         LPM HRS/YR Quantity           Lavatory Sinks         ECO1 TOTAL:         LPM         1.5         1.25         1.7           ECO2 TOTAL:         LPM         1.6 GPF TANK TYPE TOILET         1.7         2           ECO2 TOTAL:         LPF         #FLV/R         2           Water Closets         LPF         LPF         #FLV/R         1           Uninals         ECO3 TOTAL:         LPF         HFLV/R         1           ECO4 TOTAL:         LPF         LPF         #FLV/R         1           Water Closets         LPF         LPF         #FLV/R         1           Uninals         ECO4 TOTAL:         LPM         HRS/YR         0           ECO5 TOTAL:         CAPACITY: 30,500 BTU/H         334         REDUCE STORAGE TEMP         325         8760         1           Water         CAPACITY: 30,500 BTU/H         334         REDUCE STORAGE TEMP         322         8760         1           GGAS)         Heater         RECOVERY: 25,6 GAL/H         INSTALL INSUL JACKET         322         8760         1           ECO6 TOTAL:         RECOVERY: 25,6 GAL/H         INSTALL INSUL JACKET         1         1	ECO Number	Existing Fixture Systen	u	Retrofited Fixture System	Е	Usage	Fixtures	Water Leaks
SINK W/ AERATOR         9.5         NO RETROFIT         9.5         125         1           KITCHEN SINK         LPM         LPM         1         1           KITCHEN SINK         9.5         NO RETROFIT         9.5         365         2           TANK TYPE         19         1.6 GPF TANK TYPE TOILET         6.1         14600         1           S         TANK TYPE         1.0         1.0         1           B         TANK TYPE         1.0         1         1           B         TANK TYPE	SINK WWAERATOR   9.5 NO RETROFIT   9.5 125   1	ECO Type	Description	LPM	Description	LPM	<b>HRS/YR</b>	Quantity	Eliminated LPY
LPM	Lavatory Sinks	_	SINK W/ AERATOR		NO RETROFIT	9.5	125	1	
KITCHEN SINK   9.5   NO RETROFIT   9.5   365   2	ECOT TOTAL:	Lavatory Sinks							
KITCHEN SINK   9.5   NO RETROFIT   9.5   365   2	Misc. Sinks   9.5   NO RETROFIT   9.5   365   2	FCO1 TOTAL		Md -		Md	- F	+	0
TANK TYPE	Misc. Sinks	2	KITCHEN SINK	1	NO RETROEIT	0 5	365		C
TANK TYPE	COO TOTAL: 3	Misc. Sinks				2		7	
TANK TYPE   19   1.6 GPF TANK TYPE TOILET   6.1   14600   1	3         TANK TYPE         19         1.6 GPF TANK TYPE TOILET         6.1         14600         1           EC03 TOTAL:         4         LPF	ECO2 TOTAL:		LPF		LPF	#FL/YR	2	0
LPK	Water Closets	3	TANK TVDE	i-	1 & GDE TANK TVDE TOILET	۵. 1	14800	-	
LPK	ECO3 TOTAL:         LPF         #FL/YR         1           4 Urinals         LPM         LPM         HRS/YR         0           ECO4 TOTAL:         LPM         LPM         HRS/YR         0           Shower Heads         RESIDENTIAL TYPE         5.68 NO RETROFIT         5.68 245         1           ECO5 TOTAL:         TEMP         TEMP         1           Water         CAPACITY: 30,500 BTU/H         334 REDUCE STORAGE TEMP         322 8760         1           Heater         RECOVERY: 25.6 GAL/H         INSTALL INSUL JACKET         322 8760         1           ECO6 TOTAL:         CGAS)         1         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, TN	Water Closets			LOGER LAWA LIVE LOKE	- 0	14000		
LPM   HRS/YR   0	Cook Total:	FCO3 TOTAL		H DE		1 DE	#FI WR		
RESIDENTIAL TYPE	Urinals         LPM         LPM         HRS/YR         0           5 Shower Heads         Shower Heads         LPM         HRS/YR         0           ECO5 TOTAL:         TEMP         TEMP         1           ECO5 TOTAL:         6         40 GAL ? GLO 850         1           F GAPACITY:         30,500 BTU/H         334 REDUCE STORAGE TEMP         322 8760         1           Heater         RECOVERY:         25.6 GAL/H         INSTALL INSUL JACKET         322 8760         1           ECO6 TOTAL:         RECOVERY:         25.6 GAL/H         INSTALL INSUL JACKET         322 8760         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, TN	4							
RESIDENTIAL TYPE	ECO4 TOTAL:         LPM         LPM         HRS/YR         0           Shower Heads         RESIDENTIAL TYPE         5.68         NO RETROFIT         5.68         245         1           ECO5 TOTAL:         TEMP         TEMP         1         1           ECO5 TOTAL:         GAPCITY: 30,500 BTU/H         334         REDUCE STORAGE TEMP         322         8760         1           Heater         CAPACITY: 30,500 BTU/H         INSTALL INSUL JACKET         322         8760         1           Heater         RECOVERY: 25,6 GAL/H         INSTALL INSUL JACKET         322         8760         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, TN	Urinals							
RESIDENTIAL TYPE	Shower Heads	ECOA TOTAL .		DAA		NG -	a No an		•
RESIDENTIAL TYPE	Shower Heads         FESIDENTIAL TYPE         5.68         NO RETROFIT         5.68         245         1           Shower Heads         TEMP         TEMP         TEMP         1           ECOS TOTAL:         TEMP         TEMP         1           Water         CAPACITY: 30,500 BTU/H         334         REDUCE STORAGE TEMP         322         8760         1           Heater         RECOVERY: 25,6 GAL/H         INSTALL INSUL JACKET         322         8760         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, TN	ECO4 IOIAL.	- 1	_		E L	RI/CHU		0
:       TEMP       1         40 GAL ? GLO 850       40 GAL ? GLO 850       1         CAPACITY: 30,500 BTU/H       334 REDUCE STORAGE TEMP       322 8760       1         RECOVERY: 25.6 GAL/H       INSTALL INSUL JACKET       322 8760       1	ECO5 TOTAL:         TEMP         TEMP         1         1           6         40 GAL ? GLO 850         1         <	5 Shower Heads	' . i		NO RETROFIT	5.68	245	-	0
40 GAL ? GLO 850  CAPACITY: 30,500 BTU/H 334 REDUCE STORAGE TEMP 322 8760 1  RECOVERY: 25.6 GAL/H INSTALL INSUL JACKET 322 8760 1  :	6         40 GAL ? GLO 850         REDUCE STORAGE TEMP         322         8760         1           Water         CAPACITY: 30,500 BTU/H         334         REDUCE STORAGE TEMP         322         8760         1           (GAS)         ECOVERY: 25.6 GAL/H         INSTALL INSUL JACKET         322         8760         1           ECO6 TOTAL:         ECO6 TOTAL:         Asstems Engineering and Management Corporation, Knoxville, TN	ECO5 TOTAL:				TEMP		-	0
CAPACITY: 30,500 BTU/H 334 REDUCE STORAGE TEMP 322 8760 1  RECOVERY: 25.6 GAL/H INSTALL INSUL JACKET 322 8760 1  :	WaterCAPACITY: 30,500 BTU/H334 REDUCE STORAGE TEMP322 87601HeaterRECOVERY: 25.6 GAL/HINSTALL INSUL JACKET322 87601(GAS)ECO6 TOTAL:1ECO6 TOTAL:Systems Engineering and Management Corporation, Knoxville, TN	9							
RECOVERY: 25.6 GAL/H INSTALL INSUL JACKET 322 8760 1  :	Heater RECOVERY: 25.6 GAL/H INSTALL INSUL JACKET 322 8760 1  (GAS)  ECO6 TOTAL:  SYSTEMS CORP  RECOVERY: 25.6 GAL/H INSTALL INSUL JACKET 322 8760 1  A provide the second stress of the second stress	Water	1			322	8760	-	
	ECO6 TOTAL:  Systems Engineering and Management Corporation, Knoxville, TN	Heater				322	8760	-	
のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、」というでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、」というできます。「一般のでは、「一般のでは、「一般のでは、「一般のでは、」というできます。「一般のでは、「一般のでは、「一般のでは、」というできます。「一般のでは、「一般のでは、「一般のでは、「一般のでは、」というできます。「一般のでは、「一般のでは、」」というできます。「一般のでは、「一般のでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、」」というでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、「一般のでは、」」というでは、「一般のでは、」」というでは、「一般のでは、」」というでは、「一般のでは、」」というでは、「一般のでは、」」というでは、「一般のでは、」」というでは、「一般のでは、「」」」というでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「」」」というでは、「一般のでは、「」」」というでは、「」」というでは、「一般のでは、「」」」というでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「」」」というでは、「」」というでは、「一般のでは、「」」」というでは、「」」というでは、「一般のでは、「」」」というでは、「一般のでは、「」」」というでは、「一般のでは、「」」」というでは、「」」というでは、「一般のでは、「」」」というでは、「一般のでは、「」」」というでは、「」」」というでは、「一般のでは、「」」」というでは、「一般のでは、「」」」というでは、「一般のでは、「」」」というでは、「一般のでは、「」」」というでは、「」」というない、「」」」というない。」は、「」」は、「」」は、「」」は、「」」」は、「」」は、「」」は、「」は、「」	ECO6 TOTAL: 1 Systems Engineering and Management Corporation, Knoxville, TN	(GA3)							
	SYSTEMS CORP Systems Engineering and Management Corporation,	ECO6 TOTAL:			(4) 大部分等数 ランドをいいます。			-	0
		•	CORP	Svster	ns Engineering and Manager	ment C	orporation		ille. TN
SYSTEMS CORP Systems Findingering and Management Corporation						)			,
Systems Engineering and Management Corporation,									

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP	FT. KNO	X WATI	ER CON	FY94S EEAP FT. KNOX WATER CONSTRATION STUDY	TUDY	2 OF 2
		/S	CALCULAT	ION WO	ULATION WORK SHEET 2		
FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
ECO Number	Annual Water	Annual	Annual Energy	Saving	WATER	Total	Total
ECO Type	Saving LPY	ELEC KW		GAS MWH	Dollar Saving	Dollar Saving	Dollars Invested
1				0	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
3	188,340				\$78.16	\$78.16	\$418.80
Water Closets	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$418.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
5	0			0	\$0.00	\$0.00	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
9	EST ANNUAL						
Water	HOT WTR			0.89		\$9.37	
Heater	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS)						
	43,946						
ECO6 TOTAL:	43,946	0	0	6	\$0.00	\$90.33	\$60.00
SYSTEMS CORP	ORP			Systems	Engineering and	Management Cor	Systems Engineering and Management Corporation, Knoxville, TN
						Part of the same o	

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT. KNOX WATE	T. KN	OX WATE CONSERVATION STUDY	S NO	TUDY		10(
	CAL	CULAT	CALCULATION WORK SHEET 1			DATE:	5 OCT 94
FACILITY NO. :	4096		FUNCTION:	_ ,,	UNACCOL	UNACCOM PERS HOU	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY	1	Operating Hours:		24 24	5	0
ECO Number	Existing Fixture System		Retrofited Fixture System	L	Usage	Fixtures	Water Leaks
ECO Type	Description	LPM	Description	LPM	<b>HRS/YR</b>	Quantity	Eliminated LPY
1 Lavatory Sinks	SINK W/ AERATOR	9.5	NO RETROFIT	9.5	125	-	
ECO1 TOTAL:		LPM		LPM		1	0
2	KITCHEN SINK	22.7	INSTALL AERATOR	9.5	365	-	0
Misc. Sinks	SERVICE SINK	22.7	INSTALL AERATOR	9.5	09	-	212.9
ECOS TOTAL.		10		DE	WEI ND	2	242.0
LCOX IOIAL.					4	7	6.212
3 Water Closets	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	14600	-	
ECUS IOIAL:		7			#1.77.	-	0
4 Urinals							
ECO4 TOTAL:		LPM		LPM	HRS/YR	0	0
5	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.5	245	-	0
Shower Heads	1 (						
ECOS TOTAL:		TEMP		TEMP		+	0
9	40 GAL NATIONAL						
Water	CAPACITY: ?	334	REDUCE STORAGE TEMP	322	8760	1	
Heater	RECOVERY: ?		INSTALL INSUL JACKET	322	8760	1	
(GAS)							
ECO6 TOTAL:						1	0

Systems Engineering and Management Corporation, Knoxville, TN

•	FY94S EEAP FT. KNOX	FT. KNO		WATER CONS	S RVATION STUDY	TUDY	2 OF 2
		CAL	LCULAT	TION WO			
FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
ECO Number	Annual Water	Annual	Annual Energy	Saving	WATER	Total	Total
ECO Type	Saving LPY	ELEC KW	ELEC KWH	GAS MWH	Dollar Saving	Dollar Saving	Dollars Invested
1	ı			0	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
2	289,080			2	\$1.20	\$53.73	\$9.70
Misc. Sinks	47,733			-	\$0.20	\$8.87	\$9.70
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	336,813	0	0	9	\$1.40	\$62.60	\$19.40
3	188,340				\$78.16	\$78.16	\$418.80
Water Closets	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$418.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	00.0\$
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
5	0			0	\$0.00	\$0.00	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
9	EST ANNUAL						
Water	HOT WTR			0.89		\$9.37	\$16.80
Heater	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS)						
	43,946						
ECO6 TOTAL:	43,946	0	0	6	\$0.00	\$90.33	\$76.80
SYSTEMS CORP	ORP			Systems	Engineering and	Systems Engineering and Management Corporation,	ooration, Knoxville, TN

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT	T. KN	. KNOX WATE CONSERVATION STUDY	S NO	TUDY		10
	CAL	CULA	CALCULATION WORK SHEET 1			DATE:	5 OCT 94
FACILITY NO. :	4270		FUNCTION:	,	UNACCO	A PERS	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY (4BR)		Operating Hours:	'	24 24		0
ECO Number	Existing Fixture System	_	Retrofited Fixture System		Usage	Fixtures	Water Leaks
ECO Type	Description		Description	LPM	<b>HRS/YR</b>	Quantity	Eliminated LPY
1 Lavatory Sinks	SINK W/ AERATOR	9.5	NO RETROFIT	9.5	125	2	
ECO1 TOTAL:		LPM		LPM		2	0
2 Misc. Sinks	KITCHEN SINK	9.5	NO RETROFIT	9.5	365	-	0
ECO2 TOTAL:		LPF		LPF	#FL/YR	1	0
3 Water Closets	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	14600	-	
ECO3 TOTAL:		LPF		LPF	#FL/YR	1	0
4 Urinals							
ECO4 TOTAL:		LPM		LPM	HRS/YR	0	0
2	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.5	245	2	0
Shower Heads							
ECO5 TOTAL:		TEMP		TEMP		2	0
9	40 GAL RHEEM						
Water	CAPACITY: ?	325	REDUCE STORAGE TEMP	322	8760	-	
Heater (GAS)	RECOVERY: ?		INSTALL INSUL JACKET	322	8760	-	
ECO6 TOTAL:						1	0

Systems Engineering and Management Corporation, Knoxville, TN

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SYSTEMS CORP

CALCULATION WORK SHEET 2   Water Rate: 0.42 \$/KL   Energy Rate: 8/KWH   Gas Rate: 10.51 \$/MWH   Demand Rate: 8/KWH   Saving LPY KW KWH   KWH   MWH   Dollar Saving Dollar Saving Dollar Saving LPY KW KWH   KWH   MWH   S0.00 \$0.0	Total		FY94S EEAP FT. KNOX	T. KNO		WATER CONS	S AVATION STUDY	TUDY	2 OF 2
TYY NO.	TY NO :			ζ		ION WO	RK SHEET 2		
Number	TOTAL:   Cas Rate:   10.51 \$/MWH	FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
O Type         Saving LPY         Annual Mater         Total:         Co Type         Saving LPY         KWH         MWH         Dollar Saving	O Number         Annual Water         Annual ELEC         EL	2	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
20 Type         Saving LPY         KWH         MWH         Dollar Saving         Dollar Saving           101 Sinks         0         50.00         \$0.00           101 Sinks         0         0         \$0.00           101 Sinks         0         0         \$0.00           101 Sinks         0         0         \$0.00           102 Sinks         0         0         \$0.00           102 Sinks         0         0         \$0.00           102 Sinks         0         \$0.00         \$0.00           103 Sinks         0         \$0.00         \$0.00           104 Sinks         0         \$0.00         \$0.00           105 Sinks         0         \$0.00         \$0.00           107AL:         0         \$0.00         \$0.00           1	CO Type         Saving LPY LW         ELEC ELEC ELEC LOST           1 0 0 0         WWH         KWH           tory Sinks 0 0 0         0 0 0         0 0           TOTAL: 0 0 0         0 0 0         0           sc. Sinks 0 0         0 0 0         0           TOTAL: 0 0 0         0 0         0           TOTAL: 0 0 0         0 0         0           Jrinals 0 0 0         0 0         0           FOTAL: 0 0 0         0 0         0           FOTAL: 0 0 0         0 0         0           Ger Closets 0 0         0 0         0           Jrinals 0 0 0         0 0         0           Ger Closets 0 0         0 0         0           Ger Closets 0 0         0 0         0           Ger Consumer Heads 0 0         0 0         0           GAS 0 0         0 0         0           TOTAL: 43,946 0         0	ECO Number	Annual Water	Annual		Saving	WATER	Total	Total
tory Sinks         0         50.00         50.00           tory Sinks         0         0         50.00         50.00           TOTAL:         0         0         0         50.00         50.00           sc. Sinks         0         0         0         50.00         50.00           TOTAL:         0         0         0         50.00         50.00           wer Heads         0         0         0         50.00         50.00 <t< td=""><td>tory Sinks 0  tory Sinks 0  TOTAL: 0  sc. Sinks 0  TOTAL: 0  TOTAL</td><td>T O D</td><td></td><td>ELEC</td><td>ELEC</td><td>GAS</td><td>Saive O relled</td><td>Dollar Cavina</td><td>لمبومية متمالمن</td></t<>	tory Sinks 0  tory Sinks 0  TOTAL: 0  sc. Sinks 0  TOTAL: 0  TOTAL	T O D		ELEC	ELEC	GAS	Saive O relled	Dollar Cavina	لمبومية متمالمن
tory Sinks         0         60.00         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00           sc. Sinks         0         0         0         \$0.00           sc. Sinks         0         0         0         \$0.00           TOTAL:         0         0         0         \$0.00           TOTAL:         0         0         0         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00           Jrinals         0         \$0.00         \$0.00         \$0.00           Jrinals         0         \$0.00         \$0.00         \$0.00           Wer Heads         0         \$0.00         \$0.00         \$0.00           F         0         0         \$0.00         \$0.00           F         0         \$0.00         \$0.00         \$0.00           F         0         \$0.00         \$0.00         \$0.00	tory Sinks 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1	ı			0	\$0.00	\$0.00	\$0.00
TOTAL:         0         \$0.00         \$0.00           Sc. Sinks         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           TOTAL:         0         0         0         \$0.00         \$0.00           TOTAL:         188,340         0         0         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         0         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00         \$0.00         \$0.00           Ininals         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           Arinals         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           Wer Heads         0         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           E         EST ANNUAL         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00	TOTAL:  2 0 0 0 0 2 2 0 0 0 0 2 2 0 0 0 0 3 188,340 0 5 188,340 0 5 10 0 0 7 TOTAL: 5 0 0 0 0 7 TOTAL: 6 EST ANNUAL HOT WTR Heater CONSUMPTION (GAS) 10 0 0 0 6 EST ANNUAL HOT WTR Heater CONSUMPTION (GAS) 43,946 TOTAL: 43,946  TOTAL: 188,340 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
TOTAL:         0         0         0         \$0.00         \$0.00           2         0         0         \$0.00         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00         \$0.00           TOTAL:         0         0         0         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00           Jrinals         0         \$0.00         \$0.00         \$0.00           Wer Heads         0         \$0.00         \$0.00         \$0.00           Water         HOT WIR         0         \$0.00         \$0.00           GAS)         43,946         0         0         \$0.00         \$0.00           GAS)         43,946         0         0         \$0.00         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00         \$0.00         \$0.00 <td< td=""><td>TOTAL:         0         0         0           2         0         0         0           2         0         0         0           Sc. Sinks         0         0         0           TOTAL:         0         0         0           Ser Closets         0         0         0           TOTAL:         0         0         0           TOTAL:         0         0         0           Formals         0         0         0           TOTAL:         0         0         0           Formals         0         0         0           TOTAL:         0         0         0           Formals         0         0         0           Formals         0         0         0           Formals         0         0         0           General Heads         0         0         0           Gas:         HOT WITE         HOT WITE         HOT WITE           Heater         CONSUMPTION         0         0           GAS)         (LITERS)         0         0           A3,946         0         0         0</td><td></td><td>0</td><td></td><td></td><td>0</td><td>\$0.00</td><td>\$0.00</td><td>\$0.00</td></td<>	TOTAL:         0         0         0           2         0         0         0           2         0         0         0           Sc. Sinks         0         0         0           TOTAL:         0         0         0           Ser Closets         0         0         0           TOTAL:         0         0         0           TOTAL:         0         0         0           Formals         0         0         0           TOTAL:         0         0         0           Formals         0         0         0           TOTAL:         0         0         0           Formals         0         0         0           Formals         0         0         0           Formals         0         0         0           General Heads         0         0         0           Gas:         HOT WITE         HOT WITE         HOT WITE           Heater         CONSUMPTION         0         0           GAS)         (LITERS)         0         0           A3,946         0         0         0		0			0	\$0.00	\$0.00	\$0.00
s         0         \$0.00         \$0.00           s         0         \$0.00         \$0.00           to         0         \$0.00         \$0.00           to         \$0.00         \$0.00         \$0.00           ts         0         \$0.00         \$0.00           ts         0         \$0.00         \$0.00           ts         0         \$0.00         \$0.00           to         \$0.00         \$0.00         \$0.00           to         \$0.00         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           to         \$0.00         \$0.00         \$0.00           t	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
s         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           188,340         0         \$0.00         \$0.00           ts         0         \$0.00         \$0.00           ts         0         \$0.00         \$0.00           ts         0         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           ts         \$0.00         \$0.00         \$0.00           \$0         \$0.00         \$0.00         \$0.00           \$0         \$0.00         \$0.00         \$0.00           \$0         \$0.00         \$0.00         \$0.00           \$0         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2	0			0	\$0.00	\$0.00	\$0.00
0         0         \$0.00         \$0.00           ts         0         0         \$0.00           ts         0         \$0.00         \$0.00           ts         0         \$0.00         \$0.00           ts         0         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           \$0         \$0.00         \$0.00         \$0.00           \$0         \$0.00         \$0.00         \$0.00           \$0         \$0.00         \$0.00         \$0.00           \$0         \$0.00         \$0.00         \$0.00           \$0         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00 </td <td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>Misc. Sinks</td> <td>0</td> <td></td> <td></td> <td>0</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td>	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
ts         0         0         \$0.00         \$0.00           ts         0         \$78.16         \$78.16         \$78.16           ts         0         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00         \$0.00           est Annual         \$0.00         \$0.00         \$0.00         \$0.00           HOT WIR         0.25         \$0.00         \$0.00         \$0.00           (LITERS)         43,946         0         8         \$0.00         \$83.53	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0			0	\$0.00	\$0.00	\$0.00
ts       188,340       \$78.16       \$78.16         ts       0       \$0.00       \$0.00         ts       0       \$0.00       \$0.00         th       \$0.00       \$0.00       \$0.00         th       \$0       \$0.00       \$0.00         th       \$0       \$0.00       \$0.00         th       \$0       \$0.00       \$0.00         th       \$0.00	18,340 0 0 18,340 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 XNNUAL XUMPTION ITERS) 3,946 0 0 0 3,946	ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
ts         0         \$0.00         \$0.00           ts         0         \$0.00         \$0.00           188,340         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           ds         0         \$0.00           ds         0         \$0.00           ds         0         \$0.00           EST ANNUAL         0         \$0.00           HOT WIR         0.25         \$0.00           CONSUMPTION         7.70         \$80.96           43,946         0         8         \$0.00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3	188,340				\$78.16	\$78.16	\$418.80
0         \$0.00         \$0.00           188,340         \$78.16         \$78.16           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           ds         0         \$0.00           ds         0         \$0.00           EST ANNUAL         0         \$0.00           HOT WTR         0.25         \$2.00           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Water Closets	0				\$0.00	\$0.00	\$0.00
188,340         \$78.16         \$78.16           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           EST ANNUAL         0.25         \$0.00         \$0.00           HOT WTR         0.25         \$2.66           CONSUMPTION         7.70         \$80.96           43,946         0         8         \$60.00	18,340 0 0 0 0 0 0 0 0 0 0 0 Xight Mark 0		0				\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           ds         0         \$0.00           ds         0         \$0.00           eST ANNUAL         0         \$0.00           HOT WTR         0.25         \$2.66           CONSUMPTION         7.70         \$80.96           (LITERS)         0         8         \$83.63	0 0 0 0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$418.80
0         \$0.00         \$0.	0 0 0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	4	0				\$0.00	\$0.00	00'0\$
0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           d         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WTR         0.25         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96           43,946         0         8         \$0.00	0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	Urinals	0				\$0.00	\$0.00	\$0.00
o         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           est Annual         0         \$0.00         \$0.00           HOT WTR         0.25         \$2.66           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         8	0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0		0				\$0.00	\$0.00	\$0.00
ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           EST ANNUAL         0.25         \$0.00         \$0.00           HOT WTR         0.25         \$2.66           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         8         \$0.00         \$83.63	0 0 0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
ds         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           est ANNUAL         0.25         \$2.66           HOT WTR         7.70         \$80.96           CONSUMPTION         7.70         \$80.96           43,946         0         8         \$0.00	0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	5	0			0	\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00           0         0         \$0.00           EST ANNUAL         0.25         \$2.66           HOT WTR         7.70         \$80.96           CONSUMPTION         7.70         \$80.96           43,946         0         8         \$0.00         \$83.63	0 0 0 ANNUAL 0T WTR SUMPTION 17 ERS) 3,946 0 0	Shower Heads	0			0	\$0.00	\$0.00	\$0.00
0         0         \$0.00         \$0.00           EST ANNUAL         0.25         \$2.66           HOT WTR         7.70         \$80.96           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         6           43,946         0         8         \$0.00	0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0		0			0	\$0.00	\$0.00	\$0.00
EST ANNUAL         0.25         \$2.66           HOT WTR         7.70         \$80.96           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         6         8           43,946         0         8         \$0.00         \$83.63	ANNUAL  T WTR  SUMPTION  TERS)  3,946  0  0	ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
HOT WTR         0.25         \$2.66           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         8         \$0.00         \$83.63	3,946 0 0	9	EST ANNUAL						
CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         0         883.63	3,946 0 0	Water	HOT WTR			0.25		\$2.66	
(LITERS) 43,946 6 0 0 8 \$0.00 \$83.63	3,946 0 0	Heater	CONSUMPTION			7.70		\$80.96	\$60.00
43.946 0 0 8 \$0.00 \$83.63	3,946 0 0	(GAS)	(LITERS) 43 946						
		FCO6 TOTAL	43.946	0	c	~	\$0.00	\$83.63	\$60.00

Systems Engineering and Management Corporation, Knoxville, TN

JOSE SIE SIE SIE SIE SIE SIE SIE SIE SIE S	CALCULATION WORK SHEET 1   DATE: 5 O		FY94S EEAP FT		KNOX WATE CONSERVATION STUDY	FION S	TUDY		101
Part	PACILITY NO.   4358   FUNCTION:   TAPICAL OF 39 UNITS   TAPICAL OF 30 UNITS   TAPICAL		CAL	CULATION	N WORK SHEET 1			DATE:	5 OCT 94
Existing Fixture System   Retrofited Fixture System   Description   LPM   Description   LPM   Retrofited Fixture System   Usage   Fixtures Description   LPM   Resolution   LPM	Cocupancy: Existing Fixture System   Retrofited Fixture System   LPM   Description   LPM   HRS/PR Quantity	FACILITY NO.:	4358		FUNCTION:		UNACCO	M PERS	
Existing Fixture System   Retrofited Fixture System   Description   LPM   Description   LPM   HRS/YR Quantity	ECO Number	Occupancy:	FAMILY		Operating Hours:		24 24	0 86 10	0
Description   LPM   Description   LPM   HRS/YR   Quantity	ECO Type         Description         LPM         Description         LPM         HRS/RR Quantity           Lavatory Sinks         ECOT TOTAL:         LPM         ILPM         LPM         2           ECOT TOTAL:         LPM         LPF         LPF         2           ECOZ TOTAL:         LPF         LPF         LPF         LPF         LPF           ECOZ TOTAL:         LPF         LPF         LPF         LPF         LPF         LPF           ECOZ TOTAL:         LPF         LPF         LPF         LPF         LPF         LPF         LPF           ECOZ TOTAL:         LPF         LPF         LPF         LPF         LPF         LPF         LPF           ECO3 TOTAL:         LPF	ECO Number	Existing Fixture Systen	u	Retrofited Fixture Syste	m	Usage	Fixtures	Water Leaks
SINK W/ AERATOR   9.5   NO RETROFIT   9.5   125   2	ECOT TOTAL:	ECO Type	Description	V	Description	LPM	<b>HRS/YR</b>	Quantity	Eliminated LPY
KITCHEN SINK   9.5   NO RETROFIT   1.5   365   1	ECO1 TOTAL:	1 Lavatory Sinks	SINK W/ AERATOR		RETROFIT	9.5	125	2	
KITCHEN SINK   9.5   NO RETROFIT   9.5   365   1	Misc. Sinks	ECO1 TOTAL:		LPM		<u>D</u>		2	O
TANK TYPE   19 1.6 GPF TANK TYPE TOILET   6.1   #FL/YR   1	Misc. Sinks   LPF	2	KITCHEN SINK		RETROFIT	9.5	365	-	0
TANK TYPE	ECO2 TOTAL:	Misc. Sinks							
ts  I TANK TYPE  I LANK TYPE  I LOGPF TANK TYPE TOILET  I LANK TYPE  I LPF  I LPF  I LPF  I LPF  I LPM  I L	3   TANK TYPE   19   1.6 GPF TANK TYPE TOILET   6.1   14600   1	ECO2 TOTAL:		LPF		LPF	#FL/YR	-	0
ts       ts       ts         ts       LPF       LPF       #FL/YR       1         :       LPM       HRS/YR       0       1         :       LPM       HRS/YR       0       1         :       LPM       HRS/YR       0       1         st       NO RETROFIT       9.5       245       1         ds       IS       NO RETROFIT       1       1         st       TEMP       TEMP       1       1         cAPACITY: ?       334       REDUCE STORAGE TEMP       322       8760       1         RECOVERY: ?       INSTALL INSUL JACKET       322       8760       1         RECOVERY: ?       INSTALL INSUL JACKET       322       8760       1	ENTIAL TYPE  LPM  LPM  LPM  LPM  HRS/YR  0  ENTIAL TYPE  9.5 NO RETROFIT  RUUD  TEMP  TEMP	3	TANK TYPE		<b>GPF TANK TYPE TOILET</b>	6.1	14600	1	
LPF	LPF	Water Closets							
RESIDENTIAL TYPE   9.5 NO RETROFIT   9.5 245   1	ENTIAL TYPE  LPM  LPM  LPM  HRS/VR  0  9.5 245 1  TEMP  TEMP	FCO3 TOTAL:		I PF		I DE	#FI WB	-	O
RESIDENTIAL TYPE   9.5   NO RETROFIT   9.5   245   1	ENTIAL TYPE 9.5 NO RETROFIT 9.5 245 1  TEMP TEMP TEMP 10  RUUD 334 REDUCE STORAGE TEMP 322 8760 1  FERY: ? INSTALL INSUL JACKET 322 8760 1  Systems Engineering and Management Corporation, Knoxville, TN	4						-	
RESIDENTIAL TYPE   9.5   NO RETROFIT   9.5   245   1	ENTIAL TYPE         9.5         NO RETROFIT         LPM         HRS/YR         0           ENTIAL TYPE         9.5         NO RETROFIT         9.5         245         1           RUUD         TEMP         1         1         1           AERY: ?         334         REDUCE STORAGE TEMP         322         8760         1           AERY: ?         INSTALL INSUL JACKET         322         8760         1           Systems Engineering and Management Corporation, Knoxville, TN	Urinals							
RESIDENTIAL TYPE   9.5   NO RETROFIT   9.5   245   1	ENTIAL TYPE 9.5 NO RETROFIT 2.45 1  TEMP TEMP 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	FCOA TOTAL .		Md		I DAG		c	
CAPACITY: ?   334 REDUCE STORAGE TEMP   322 8760   1	TEMP		1	_	TITOCIT			,	
:         TEMP         1           40 GAL RUUD         334 REDUCE STORAGE TEMP         322 8760         1           RECOVERY: ?         INSTALL INSUL JACKET         322 8760         1           .:         1         1         1	RUUD SITY: ?  RENUE SITY: ?  REDUCE STORAGE TEMP 322 8760 1 INSTALL INSUL JACKET 322 8760 1  Systems Engineering and Management Corporation, Knoxville, TN	Shower Heads			KEIROFII	6.0	242	-	0
40 GAL RUUD       334 REDUCE STORAGE TEMP       322 8760 1         CAPACITY: ?       1 322 8760 1         RECOVERY: ?       INSTALL INSUL JACKET       322 8760 1         :       1 322 8760 1	Systems Engineering and Management Corporation, Knoxville, TN	ECOS TOTAL:		TEMP		TEMP		-	0
CAPACITY: ?       334 REDUCE STORAGE TEMP       322 8760       1         RECOVERY: ?       INSTALL INSUL JACKET       322 8760       1         :       . <t< td=""><td>ITY: ?  334 REDUCE STORAGE TEMP 322 8760 1  INSTALL INSUL JACKET 322 8760 1  INSTALL INSUL JACKET 322 8760 1  Systems Engineering and Management Corporation, Knoxville, TN</td><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	ITY: ?  334 REDUCE STORAGE TEMP 322 8760 1  INSTALL INSUL JACKET 322 8760 1  INSTALL INSUL JACKET 322 8760 1  Systems Engineering and Management Corporation, Knoxville, TN	9							
RECOVERY: ? INSTALL INSUL JACKET 322 8760 1 :	VERY: ?  INSTALL INSUL JACKET 322 8760 1  Systems Engineering and Management Corporation, Knoxville, TN	Water	Ξ.		DUCE STORAGE TEMP	322	8760	1	
	Systems Engineering and Management Corporation, Knoxville, TN	Heater		SNI	STALL INSUL JACKET	322	8760	-	
のでは、「一般のでは、一般のでは、これでは、これでは、これでは、これでは、これでは、これでは、これでは、これ	Systems Engineering and Management Corporation, Knoxville, TN	(649)							
	Systems Engineering and Management Corporation,	ECO6 TOTAL:				1 × 100 × 10		7	0
			CORP	Systems I	Engineering and Manage	ment C	orporation		ille, TN
SYSTEMS CORP Systems Engineering and Management Corporation,									

Systems Engineering and Management Corporation, Knoxville, TN

S/KL	CALCULAT   CALCULAT		FY94S EEAP FT. KNOX	T. KNO		WATER CONS	SVATION STUDY	TUDY	2 OF 2
Water Rate:         0.42         \$/KL         Energy Rate:         \$/KV         FANNH         Demand Rate:         \$/KN           7         Annual Water         Annual Energy Saving         WATER         Total         \$/KN           8 Saving LPY         KW         KWH         MWH         Dollar Saving         \$/LOO           10         0         0         \$/LOO         \$/LOO         \$/LOO           188,340         0         \$/LOO         \$/LOO         \$/LOO         \$/LOO           188,340         0         \$/LOO         \$/LOO         \$/LOO         \$/LOO         \$/LOO           10         0         0         \$/LOO         \$/LOO         \$/LOO         \$/LOO         \$/LOO           10         0         0 <t< td=""><td>Water Rate:         0.42         \$/KL           Gas Rate:         10.51         \$/MWH           Annual Water         Annual Energy &amp; KWH         \$/MWH           Saving LPY KW KWH         \$/MWH         \$/MWH           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           EST ANNUAL         HOT WTR           CONSUMPTION         (LITERS)           43,946         0         0           43,946         0         0</td><td></td><td></td><td>/O</td><td>ALCULAT</td><td>ION WOI</td><td></td><td></td><td></td></t<>	Water Rate:         0.42         \$/KL           Gas Rate:         10.51         \$/MWH           Annual Water         Annual Energy & KWH         \$/MWH           Saving LPY KW KWH         \$/MWH         \$/MWH           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           EST ANNUAL         HOT WTR           CONSUMPTION         (LITERS)           43,946         0         0           43,946         0         0			/O	ALCULAT	ION WOI			
Column   C	tate:       10.51       \$/MWH         tal Water       Annual Energy       ELEC       O       O<	FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
er         Annual Water         Annual ELEC         ELEC         GAS         WATER         Total           saving         LPY         KW         KWH         MWH         Dollar Saving         S0.00           nks         0         0         0         \$0.00         \$0.00           s         0         0         0         \$0.00         \$0.00           s         0         0         0         \$0.00         \$0.00           s         0         0         \$0.00         \$0.00         \$0.00           s         0         \$0.00	ng         LPY         KW         KWH           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           ANNUAL         0         0           0         0         0           3,946         0         0           3,946         0         0	0000	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
saving         LPY         KWH         MWH         Dollar Saving         Dollar Saving           nks         0         0         50.00         50.00           st         0         0         50.00         50.00           st         0         0         50.00         50.00           st         0         0         0         50.00           st         0         0         50.00         50.00           st         0         50.00         50.00         50.00           st         0         50.00         50.00         50.00           st         0         0         50.00         50.00           st <td>ng         LPY         KWH         MWH         Dollar Saving         Dollar Saving         Dollar Saving           0         0         \$0.00         \$0.00         \$0.00           0         0         0         \$0.00         \$0.00           0         0         0         \$0.00         \$0.00           0         0         0         \$0.00         \$0.00           0         0         0         \$0.00         \$0.00           0         0         0         \$0.00         \$0.00           0         0         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           ANINUAL         0         \$0.00         \$0.00         <t< td=""><td>ECO Number</td><td>Annual Water</td><td>Annua</td><td></td><td>Saving</td><td>WATER</td><td>Total</td><td>Total</td></t<></td>	ng         LPY         KWH         MWH         Dollar Saving         Dollar Saving         Dollar Saving           0         0         \$0.00         \$0.00         \$0.00           0         0         0         \$0.00         \$0.00           0         0         0         \$0.00         \$0.00           0         0         0         \$0.00         \$0.00           0         0         0         \$0.00         \$0.00           0         0         0         \$0.00         \$0.00           0         0         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           ANINUAL         0         \$0.00         \$0.00 <t< td=""><td>ECO Number</td><td>Annual Water</td><td>Annua</td><td></td><td>Saving</td><td>WATER</td><td>Total</td><td>Total</td></t<>	ECO Number	Annual Water	Annua		Saving	WATER	Total	Total
National Processing	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ECO Type		ELEC	ELEC	GAS	Dollar Saving	Dollar Saving	Dollars Invested
nks         0         \$0.00         \$0.00           s         0         \$0.00         \$0.00           ets         0         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00 </td <td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>1</td> <td></td> <td></td> <td></td> <td>0</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td>	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1				0	\$0.00	\$0.00	\$0.00
0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
:         0         0         \$0.00         \$0.00           is         0         0         \$0.00         \$0.00           is         0         0         \$0.00         \$0.00           is         0         0         \$0.00         \$0.00           ets         0         0         \$0.00         \$0.00           ets         0         \$0.00         \$0.00         \$0.00           ets         0         \$0.00         \$0.00         \$0.00           in         188,340         \$0.00         \$0.00         \$0.00           in         0         \$0.00         \$0.00         \$0.00           in<	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0			0	\$0.00	\$0.00	\$0.00
s         0         \$0.00         \$0.00           s         0         \$0.00         \$0.00           to         0         \$0.00         \$0.00           ts         0         0         \$0.00           ts         0         \$0.00         \$0.00           ts         0         \$0.00         \$0.00           ts         0         \$0.00         \$0.00           ts         0         \$0.00         \$0.00           to         \$0.00         \$0.00         \$0.00           d         \$0.00         \$0.00         \$0.00           EST ANNUAL         \$0.89         \$0.00         \$0.00           HOT WIR         \$0.89         \$0.00         \$0.00           CONSUMPTION         7.70         \$0.00         \$0.00           43,946         0         \$0.00         \$0.00         \$0.00           43,946         0         \$0.00         \$0.00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
s         0         \$0.00         \$0.00           c         0         0         \$0.00         \$0.00           ts         0         0         \$0.00         \$0.00           ts         0         0         \$0.00         \$0.00           ts         0         \$0.00         \$0.00         \$0.00           th         HOT WIR         0         \$0.00         \$0.00           th         1         \$0.00         \$0.00         \$0.00           th         0         0         \$0.00         \$0.00           th         0         \$0.00         \$0.00         \$0.00           th         43,946         0         0         \$0.00         \$0.00           th	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2	0			0	\$0.00	\$0.00	\$0.00
ts 0 0 0 0 \$0.00 \$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
tfs         0         0         \$0.00         \$0.00           tfs         0         \$78.16         \$78.16         \$78.16           tfs         0         \$0.00         \$0.00         \$0.00           tfs         \$0.00         \$0.00         \$0.00 <td>88,340 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td></td> <td>0</td> <td></td> <td></td> <td>0</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td>	88,340 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0			0	\$0.00	\$0.00	\$0.00
tfs         188,340         \$78.16         \$78.16           tfs         0         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WIR         0.89         \$0.00         \$0.00           CONSUMPTION         7.70         \$0.00         \$0.00           43,946         0         9         \$0.00           43,946         0         9         \$0.00	18,340 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
tfs         0         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           EST ANNUAL         0.89         \$0.00         \$0.00           HOT WIR         0.89         \$0.00         \$0.00           CONSUMPTION         7.70         \$0.00         \$0.00           43,946         0         9         \$0.00         \$0.00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1	3	188,340				\$78.16	\$78.16	\$418.80
0         \$0.00         \$0.00           188,340         \$78.16         \$78.16           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           eST ANNUAL         \$0.89         \$0.00           HOT WTR         \$0.89         \$0.00           (LITERS)         \$0.00         \$0.00           43,946         \$0         \$0           0         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00           \$0.00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Water Closets	0				\$0.00	\$0.00	\$0.00
188,340         \$78.16         \$78.16           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           color         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           eST ANNUAL         0         \$0.00         \$0.00           HOT WITA         0.89         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96           43,946         0         9         \$0.00         \$0.00	18,340 0 0 0 0 0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0		0				\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00           0         \$0.00         \$0.00           sds         \$0.00         \$0.00           ads         0         \$0.00         \$0.00           ads         0         \$0.00         \$0.00           constant         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WTR         0.89         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96           43,946         0         9         \$0.00         \$90.33	0 0 0 0 0 0 0 0 ANNUAL 5T WTR SUMPTION 1TERS) 3,946 0 0	ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$418.80
0         \$0.00         \$0.00           1         0         \$0.00         \$0.00           ads         0         \$0.00         \$0.00           ads         0         \$0.00         \$0.00           1         0         0         \$0.00         \$0.00           1         EST ANNUAL         0         0         \$0.00         \$0.00           HOT WTR         0         0         \$0.00         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96         \$0.37         \$0.34           43,946         0         9         \$0.00         \$0.00           1:         43,946         0         9         \$0.00	0 0 0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	4	0				\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00            0         \$0.00         \$0.00            0         \$0.00         \$0.00            0         \$0.00         \$0.00            0         \$0.00         \$0.00            0         \$0.00         \$0.00            EST ANNUAL         0.89         \$0.00         \$0.00           HOT WTR         0.89         \$0.00         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96         \$0.37           43,946         0         9         \$0.00         \$0.00            43,946         0         9         \$0.00	0 0 0 0 0 ANNUAL 0 0 0 3,946 3,946 0 0	Urinals	0				\$0.00	\$0.00	\$0.00
.:         0         \$0.00<	0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0		0				\$0.00	\$0.00	\$0.00
ads         0         \$0.00         \$0.00           ads         0         \$0.00         \$0.00           -:         0         \$0.00         \$0.00           -:         0         0         \$0.00         \$0.00           -:         0         0         \$0.00         \$0.00         \$0.00           EST ANNUAL         0.89         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96         \$0.00 <td>0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0</td> <td>ECO4 TOTAL:</td> <td>0</td> <td></td> <td></td> <td></td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td>	0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
ads         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           :         0         0         \$0.00         \$0.00           EST ANNUAL         0.89         \$0.00         \$0.37         \$0.00           HOT WTR         0.89         \$9.37         \$0.00         \$0.96           CONSUMPTION         7.70         \$80.96         \$0.00         \$0.00           43,946         0         9         \$0.00         \$0.33	0 0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	2	0			0	\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00           EST ANNUAL         0         0         \$0.00         \$0.00           HOT WTR         0.89         \$9.37           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         9         \$0.00         \$90.33	0 0 0 ANNUAL 0T WTR SUMPTION 1.946 0 0	Shower Heads	0			0	\$0.00	\$0.00	\$0.00
L:         0         0         \$0.00         \$0.00           EST ANNUAL         0.89         \$9.37           HOT WTR         7.70         \$80.96           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         9           L:         43,946         0         9         \$0.00         \$90.33	0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0		0			0	\$0.00	\$0.00	\$0.00
EST ANNUAL         0.89         \$9.37           HOT WTR         0.89         \$80.96           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         9         \$0.00         \$90.33	ANNUAL  T WTR  SUMPTION  TERS)  3,946  0  0	ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
HOT WTR 0.89 \$9.37 CONSUMPTION 7.70 \$80.96 (LITERS) \$43,946 0 0 9 \$0.00 \$90.33	3,946 0 0	9	EST ANNUAL						
CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         9         \$0.00         \$90.33	3,946 0 0	Water	HOT WTR			0.89		\$9.37	
(LITERS) 43,946 43,946 0 0 9 \$0.00 \$90.33	3,946 0 0	Heater	CONSUMPTION			7.70		\$80.96	\$60.00
43,946     0     9     \$0.00     \$90.33	3,946 3,946 0 0	(GAS)	(LITERS)						
43,946 0 0 9 \$0.00 \$90.33	3,946 0 0		43,946						
		ECO6 TOTAL:	43,946	0	0	6	\$0.00	\$90.33	\$60.00

Systems Engineering and Management Corporation, Knoxville, TN

FACILITY NO:         4363 B         FUNCTION         INACCOM PERS HOUS DET FAUTORING         FOCUPATION         INTEGRAL OF 48 UNITS         6 OCT 94           Occupancy:         FAMILY         Operating Hours:         TYPICALOF 48 UNITS         PAMILY         AVAILATION DET F/A           ECO Number         Existing Fixture System         Retrofited Fixture System         NO RETROFIT         LPM         HRSYR Quantity         Mater Leaks           ECO 1 Vipe         Description         LPM         Retrofited Fixture System         LPM         HRSYR Quantity         Mater Leaks           ECO1 VOTAL:         AVAERATIOR         9.5         NO RETROFIT         9.5         1.2         1         0           Misc. Sinks         AVAICHEN SINK         1.9         1.6 GPF TANK TYPE TOILET         1.7         1         0           Water Closets         AVAICH CLOSETS         1.9         1.6 GPF TANK TYPE TOILET         1.7         0         0           ECO3 TOTAL:         LPM         RESIDENTIAL TYPE         1.9         1.6 GPF TANK TYPE TOILET         1.7         0         0           ECO5 TOTAL:         RECOVERY:         1.9         1.0 GAL RHEBMFURY         1.0         0         0           ECO5 TOTAL:         GADACITY:         1.0         1.0	FOCUPATION   CALCULATION WORK SHEET 1   DATE: 5 C CALCULATION WORK SHEET 1   DATE: 5 C C CALCULATION WORK SHEET 1   DATE: 5 C C C CALCULATION   Description   LPM   TYPICAL OF 48 UNITS   TYPICAL OF	FACILITY NO.   A363 B   FUNCTION:   PAGE   PUNCTION:   PAGE   PUNCTION:   PAGE   PUNCCOM PERS HOUS   PUN	CALCULATION WORK SHEET 1   DATE: 5 C		FY94S EEAP FT		KNOX WAT CONSERVATION STUDY	SNOL	TUDY		10
EAMILY	PACILITY NO. :   4363 B	PACILITY NO.   4363 B   PUNCTION:   LANGED   PUNCTION:   LANGED   PUNCTION:   LANGED   PUNCTION:   LANGED   PUNCTION:   LANGED   LANGED   PUNCTION:   LANGED   LANG	PACILITY NO. : 4363 B		CALC	ULATI	ON WORK SHEET 1			DATE:	5 OCT 94
Existing Fixture System   Retrofited Fixture System   Description   LPM   Description   LPM   Description   LPM   Description   LPM   RISYR Quantity	Cocupancy: EAMILY   Coperating Hours: 24   Country	Cocupancy: Existing Fixture System   Retrofited Fixture System   LPM   Description   LPM   LPM	Cocupancy: Existing Fixture System   Cocupancy: Existing Fixture System   Cocupancy: ECO Number   Existing Fixture System   LPM   Description   LPM   HRS/PR Quantity   1	FACILITY NO.:	4363 B		FUNCTION:	ľ	UNACCO	M PERS	HOUS DET FAC
Comparing Fixture System   Retrofited Fixture System   LPM   Description   LPM   HRS/YR Quantity	ECO Number         Existing Fixture System         Retrofited Fixture System         Usage Description         Fixtures           ECO Type         Description         1LPM         HRS/TR Quantity           Lavatory Sinks         ECOT TOTAL:         LPM         125         1           ECOZ TOTAL:         KITCHEN SINK         9.5         NO RETROFIT         9.5         365         1           Misc. Sinks         Misc. Sinks         19         1.6 GPF TANK TYPE TOILET         6.1         4         1           ECOZ TOTAL:         Autor Closets         19         1.6 GPF TANK TYPE TOILET         6.1         4         1         1           Water Closets         ECO3 TOTAL:         LPF         #FLV/R         1	ECO Number         Existing Fixture System         Retrofiled Fixture System         Usage Prixtures Frutures         Fixtures           ECO Type         Description         1.PM         HRS/PR Quantity           Lavatory Sinks         SINK W/A ERATOR         9.5         NO RETROFIT         1.5           ECO1 TOTAL:         KITCHEN SINK         9.5         NO RETROFIT         1.DM         1.DM           Misc. Sinks         KITCHEN SINK         9.5         NO RETROFIT         9.5         1.1           ECO2 TOTAL:         KITCHEN SINK         1.0         1.0         1.0         1.0           Water Closets         Autorials         1.0         1.6         6PF TANK TYPE TOILET 6.1         1.4600         1.1           ECO3 TOTAL:         LPR         LPR         #ELVR         1.1           Water Closets         RESIDENTIAL TYPE         9.5         NO RETROFIT         9.5         245         1.1           ECO3 TOTAL:         GAAL RHEEM/FURY         1.0         1.0         1.0         1.0         1.0           Mater         GAPACITY:         7         3.5         REDUCE STORAGE TEMP         3.5         3.6         1.1           Haater         RECOVERY:         7         1.0         1.0	ECO Number         Existing Fixture System         Retrofited Fixture System         Usage Fixtures         Fixtures           ECO Type         Description         1.PM         HRS/PR Quantity           Lavatory Sinks         SINK W/ AERATOR         9.5 NO RETROFIT         1.DM           ECO1 TOTAL:         LPM         LPM         1.DM           ECO2 TOTAL:         LPM         NO RETROFIT         9.5 365         1           Misc. Sinks         KITCHEN SINK         9.5 NO RETROFIT         1.DM         1.14600         1           Mater Closets         A         1.6 GPF TANK TYPE TOILET         6.1 14600         1           Water Closets         LPF         LPF         #FLVR         1           ECO3 TOTAL:         LPF         LPF         #FLVR         1           ECO4 TOTAL:         LPF         LPF         HFLVR         1           ECO5 TOTAL:         LPM         NO RETROFIT         LPM         HRS/YR         0           Shower Heads         ECO5 TOTAL:         TEMP         TEMP         TEMP         1           ECO5 TOTAL:         A         4.0 GAL RHEEM/FURY         325 REDUCE STORAGE TEMP         325 REDUCE STORAGE TEMP         1           GAS)         Haater         RECOV	Occupancy:	FAMILY		Operating Hours:	'	1 FICAL 24		0
Note	ECO Type         Description         LPM         Description         LPM         HRS/YR Quantity           1 Lavatory Sinks         ECO1 TOTAL:         LPM         LPM         LPM         1           ECO2 TOTAL:         KITCHEN SINK         9.5 NO RETROFIT         9.5 365         1           ECO2 TOTAL:         LPF         LPF         #FL/YR         1           ECO2 TOTAL:         LPF         LPF         #FL/YR         1           ECO3 TOTAL:         LPF         LPF         #FL/YR         1           ECO3 TOTAL:         LPF         LPF         #FL/YR         1           Urinals         ECO4 TOTAL:         LPM         HRS/YR         0           ECO5 TOTAL:         LPM         HRS/YR         0           Shower Heads         ECO5 TOTAL:         LPM         HRS/YR         0           ECO5 TOTAL:         CAPACITY: ?         TEMP         1         1           Water         CAPACITY: ?         TEMP         TEMP         1           Water         CAPACITY: ?         INSTALL INSUL JACKET         322         8760         1           Heater         RCOS TOTAL:         INSTALL INSUL JACKET         1         1           GAS)	ECO Type         Description         LPM         HRS/YR Quantity           Lavatory Sinks         LPM         LPM         LPM         125         1           ECO1 TOTAL:         LPM         9.5         NO RETROFIT         1.PM         1           ECO2 TOTAL:         LPF         LPF         #ELV/R         1           ECO2 TOTAL:         LPF         LPF         #ELV/R         1           Water Closets         TANK TYPE         19         1.6 GPF TANK TYPE TÖLLET         6.1         14600         1           Unitals         GCO3 TOTAL:         LPF         #ELV/R         1         1         1           ECO3 TOTAL:         LPM         NO RETROFIT         9.5         NO RETROFIT         1         1         1           ECO4 TOTAL:         BCO4 TOTAL:         LPM         RESIDENTIAL TYPE         9.5         NO RETROFIT         9.5         245         1           ECO5 TOTAL:         TEMP         TEMP         TEMP         TEMP         1         1           ECO5 TOTAL:         RECOVERY: ?         INSTALL INSUL JACKET         322         8760         1           ECO5 TOTAL:         RECOVERY: ?         INSTALL INSUL JACKET         322         8760	ECO Type         Description         LPM         Description         LPM         HRS/YR Quantity           Lavatory Sinks         SINK W/ AERATOR         9.5 NO RETROFIT         1.5 NO	ECO Number	Existing Fixture System		Retrofited Fixture Syster		Usage	Fixtures	Water Leaks
SINK W/ AERATOR   9.5   NO RETROFIT   9.5   125   1	Lavatory Sinks	Tavatory Sinks	Lavatory Sinks   Sink Wy Aerator   9.5   NO RETROFIT   9.5   125   1	ECO Type	_		Description		<b>HRS/YR</b>	Quantity	Eliminated LPY
KITCHEN SINK   1.6   1	Lavatory Sinks	Lavatory Sinks	Lavatory Sinks		SINK W/ AERATOR		NO RETROFIT	9.5	125	1	
KITCHEN SINK   LPM   S.5   NO RETROFIT   9.5   365   1	LPM   LPM   LPM   LPM   LPM   LPM   LPM   Substitute	Nateral	ECOT TOTAL:	Lavatory Sinks							
KITCHEN SINK   9.5   NO RETROFIT   9.5   365   1	2         KITCHEN SINK         9.5         NO RETROFIT         9.5         365         1           ECO2 TOTAL:         3         TANK TYPE         19         1.6 GPF TANK TYPE TOILET         6.1         14600         1           ECO3 TOTAL:         LPF         LPF         #FLYR         1           ECO4 TOTAL:         LPM         LPM         HRS/YR         0           ECO4 TOTAL:         LPM         LPM         LPM         HRS/YR         0           ECO5 TOTAL:         LPM         LPM         HRS/YR         0         0           ECO5 TOTAL:         FESIDENTIAL TYPE         9.5         NO RETROFIT         9.5         245         1           ECO5 TOTAL:         FEOVERY: ?         1         1         1         1           Water         CAPACITY: ?         1         1         1         1           GAS)         GAPACITY: ?         1         1         1         1         1           GAS)         GAS         1         1         1         1         1         1           ECO6 TOTAL:         FEOVERY: ?         225         REDUCE STORAGE TEMP         322         8760         1         1           GAS) </td <td>  Misc. Sinks   HITCHEN SINK   9.5 NO RETROFIT   9.5 365 1    </td> <td>  Misc. Sinks</td> <td>ECO1 TOTAL:</td> <td></td> <td>LPM</td> <td></td> <td>LPM</td> <td></td> <td>-</td> <td>0</td>	Misc. Sinks   HITCHEN SINK   9.5 NO RETROFIT   9.5 365 1	Misc. Sinks	ECO1 TOTAL:		LPM		LPM		-	0
TANK TYPE	Misc. Sinks         Misc. Sinks         LPF         LPF         HFLYR         1           ECO2 TOTAL:         3         TANK TYPE         19         1.6 GPF TANK TYPE TOILET         6.1         14600         1           Water Closets         LPR         LPR         HFLYR         1           ECO3 TOTAL:         LPR         LPR         HFLYR         1           ECO4 TOTAL:         LPM         LPR         HRS/YR         0           ECO4 TOTAL:         LPM         HRS/YR         0         1           Shower Heads         ECO5 TOTAL:         Shower Heads         1         1           ECO5 TOTAL:         CAPACITY:         7         1         1           Water         CAPACITY:         7         1         1           Water         CAPACITY:         7         1         1           (GAS)         RECOVERY:         7         1         1           ECO6 TOTAL:         RECOVERY:         7         1         1	Misc. Sinks	Nisc. Sinks   LPF	2	KITCHEN SINK	1	NO RETROFIT	9.5	365	1	0
TANK TYPE	ECO2 TOTAL:	ECO2 TOTAL:         LPF         HELYR         1           Water Closets         19         1.6 GPF TANK TYPE TOILET         6.1         14600         1           ECO3 TOTAL:         LPF         LPF         HELYR         1           ECO4 TOTAL:         LPM         HRS/NR         0           ECO4 TOTAL:         LPM         HRS/NR         0           ECO5 TOTAL:         LPM         HRS/NR         0           ECO5 TOTAL:         LPM         HRS/NR         0           ECO5 TOTAL:         TEMP         TEMP         1           ECO5 TOTAL:         TEMP         TEMP         1           Heater         RECOVERY: ?         1         1           GAS)         INSTALL INSUL JACKET         322         8760         1           ECO6 TOTAL:         INSTALL INSUL JACKET         1         1           ECO6 TOTAL:         INSTALL INSUL JACKET         1         1	TANK TYPE   19 1.6 GPF TANK TYPE TOILET   6.1 14600   1	Misc. Sinks							
TANK TYPE   19   1.6 GPF TANK TYPE TOILET   6.1   14600   1	3         TANK TYPE         19         1.6 GPF TANK TYPE TOILET         6.1         14600         1           ECO3 TOTAL:         LPF         #FLYR         1           4         Urinals         LPM         #FLYR         1           ECO4 TOTAL:         LPM         HRS/YR         0           ECO5 TOTAL:         LPM         HRS/YR         0           Shower Heads         ECO5 TOTAL:         1         1           ECO5 TOTAL:         TEMP         TEMP         1           6         40 GAL RHEEM/FURY         TEMP         1           6         40 GAL RHEEM/FURY         1         1           Heater         RECOVERY: ?         325 REDUCE STORAGE TEMP         322 8760         1           (GAS)         1         1         1         1           ECO5 TOTAL:         1         1         1	3         TANK TYPE         19         1.6 GPF TANK TYPE TOILET         6.1         14600         1           ECO3 TOTAL:         LPF         LPF         #FL/YR         1           ECO4 TOTAL:         LPM         HRS/YR         0           ECO4 TOTAL:         LPM         HRS/YR         0           ECO5 TOTAL:         LPM         HRS/YR         0           Shower Heads         ECO5 TOTAL:         TEMP         TEMP         TEMP           ECO5 TOTAL:         TEMP         TEMP         TEMP         1           ECO5 TOTAL:         A0 GAL RHEEM/FURY         325 REDUCE STORAGE TEMP         322 8760         1           Water         RECOVERY: ?         1 INSTALL INSUL JACKET         322 8760         1           ECO6 TOTAL:         INSTALL INSUL JACKET         322 8760         1           ECO6 TOTAL:         INSTALL INSUL JACKET         322 8760         1           ECO6 TOTAL:         1         1           Application, Knoxville, TN	3         TANK TYPE         19         1.6 GPF TANK TYPE TOILET         6.1         14600         1           EC03 TOTAL:         LPF         LPF         LPF         1           EC04 TOTAL:         LPM	ECO2 TOTAL:		LPF		LPF	#FL/YR		0
S	Water Closets         LPF         #FL/YR         1           ECO3 TOTAL:         LPF         #FL/YR         1           Urinals         LPM         HRS/YR         0           ECO4 TOTAL:         LPM         HRS/YR         0           ECO4 TOTAL:         LPM         HRS/YR         0           Shower Heads         RESIDENTIAL TYPE         9.5 NO RETROFIT         1           ECO5 TOTAL:         CAPACITY: ?         325 REDUCE STORAGE TEMP         1           ECO5 TOTAL:         RECOVERY: ?         INSTALL INSUL JACKET         322 8760         1           ECO6 TOTAL:         RECO TOTAL:         1         1	Water Closets         LPF         LPF         #FLVYR         1           ECO3 TOTAL:         LPM         LPF         #FLVYR         1           ECO4 TOTAL:         LPM         LPM: HRS/YR         0           ECO4 TOTAL:         LPM         LPM: HRS/YR         0           Shower Heads         Shower Heads         245         1           ECO5 TOTAL:         TEMP         TEMP         1           ECO5 TOTAL:         TEMP         1         1           6         40 GAL RHEEM/FURY         325 REDUCE STORAGE TEMP         322 8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322 8760         1           (GAS)         ECO6 TOTAL:         1         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, TN	Water Closets         LPF         LPF         #FL/YR         1           EC03 TOTAL:         4         Urinals         LPM         HRS/YR         1           EC04 TOTAL:         5         NO RETROFIT         9.5         245         1           Shower Heads         EC05 TOTAL:         1         1         1           EC05 TOTAL:         A0 GAL RHEEM/FURY         1         1         1           EC05 TOTAL:         A0 GAL RHEEM/FURY         225         8760         1         1           Heater         RECOVERY:         325         REDUCE STORAGE TEMP         322         8760         1           (GAS)         RECOVERY:         INSTALL INSUL JACKET         322         8760         1           EC06 TOTAL:         (GAS)         RECOVERY:         1         1           (GAS)         RECOVERY:         1         1           (GAS)         RECOVERY:         1         1           EC06 TOTAL:         1         1	8	TANK TYPE	1	6 GPF TANK TYPE TOILET	6.1	14600	1	
: LPF #FL/YR 1    LPM	ECO3 TOTAL :	COO TOTAL:	CO3 TOTAL:	Water Closets							
RESIDENTIAL TYPE   9.5 NO RETROFIT   9.5   245   1	4         4           Urinals         LPM         LPM         HRS/YR         0           ECO4 TOTAL:         Shower Heads         LPM         HRS/YR         0           Shower Heads         ECO5 TOTAL:         TEMP         1         1           ECO5 TOTAL:         TEMP         TEMP         1         1           ECO5 TOTAL:         TEMP         TEMP         1         1           Water         CAPACITY:         325 REDUCE STORAGE TEMP         322 8760         1           Heater         RECOVERY:         NSTALL INSUL JACKET         322 8760         1           GAS)         INSTALL INSUL JACKET         322 8760         1           ECO6 TOTAL:         A COMPACITY STALL INSUL JACKET         A COMPACITY STALL STA	LPM   HRS/YR   0	4	ECO3 TOTAL:		LPF		LPF	#FL/YR	-	0
LPM   HRS/YR   0	Urinals         LPM         LPM         HRS/YR         0           ECO4 TOTAL:         LPM         HRS/YR         0           5         RESIDENTIAL TYPE         9.5         NO RETROFIT         9.5         245         1           Shower Heads         TEMP         TEMP         TEMP         1         1           ECO5 TOTAL:         CAPACITY: ?         325         REDUCE STORAGE TEMP         32         8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322         8760         1           ECO6 TOTAL:         ECO6 TOTAL:         1         1         1	Urinals         LPM         LPM         HRS/YR         0           ECO4 TOTAL:         ECO4 TOTAL:         LPM         HRS/YR         0           Shower Heads         Shower Heads         1         1           ECO5 TOTAL:         TEMP         1         1           ECO5 TOTAL:         TEMP         1         1           G 40 GAL RHEEM/FURY         325 REDUCE STORAGE TEMP         322 8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322 8760         1           GAS)         ECO6 TOTAL:         1         1         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, TN	Urinals         LPM         LPM         HRS/YR         0           ECO4 TOTAL:         5         NO RETROFIT         9.5         245         1           Shower Heads         Shower Heads         1         1         1           ECO5 TOTAL:         TEMP         TEMP         1         1           ECO5 TOTAL:         CAPACITY: ?         325         REDUCE STORAGE TEMP         32         8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322         8760         1           GAS)         ECO6 TOTAL:         INSTALL INSUL JACKET         322         8760         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, TN	4							
RESIDENTIAL TYPE   9.5   NO RETROFIT   9.5   245   1	ECO4 TOTAL :         LPM         HRS/YR         0           5 Shower Heads         Shower Heads         LPM         HRS/YR         0           Shower Heads         Shower Heads         NO RETROFIT         1         1           ECO5 TOTAL :         TEMP         TEMP         1         1           ECO5 TOTAL :         CAPACITY: ?         325 REDUCE STORAGE TEMP         322 8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322 8760         1           (GAS)         ECO6 TOTAL :         CAPACITY :         A STALL INSUL JACKET         B TOTAL :	ECO4 TOTAL:         LPM         HRS/YR         0           5         RESIDENTIAL TYPE         9.5         NO RETROFIT         9.5         245         1           Shower Heads         RESIDENTIAL TYPE         9.5         NO RETROFIT         9.5         245         1           ECO5 TOTAL:         TEMP         TEMP         TEMP         1           Water         CAPACITY: ?         325         REDUCE STORAGE TEMP         322         8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322         8760         1           GAS)         ECO6 TOTAL:         Asstems Engineering and Management Corporation, Knoxville, TN	ECO4 TOTAL :         LPM         HRS/YR         0           Shower Heads         Shower Heads         LPM         HRS/YR         0           ECO5 TOTAL :         TEMP         TEMP         1           ECO5 TOTAL :         TEMP         1           ECO5 TOTAL :         TEMP         1           Water         CAPACITY: ?         325         REDUCE STORAGE TEMP         322         8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322         8760         1           (GAS)         GAS)         ECO6 TOTAL :         1         1           ECO6 TOTAL :         Systems Engineering and Management Corporation, Knoxville, TN	Urinals							
RESIDENTIAL TYPE   9.5   NO RETROFIT   9.5   245   1	Shower Heads   Shower Heads   9.5   NO RETROFIT   9.5   245   1	Shower Heads	Shower Heads   Show	A TOT FOOL				110			c
RESIDENTIAL TYPE   9.5 NO RETROFIT   9.5 245   1	5         RESIDENTIAL TYPE         9.5         NO RETROFIT         9.5         245         1           Shower Heads         ECOS TOTAL:         TEMP         TEMP         1           ECOS TOTAL:         TEMP         TEMP         1           Water         CAPACITY: ?         325         REDUCE STORAGE TEMP         322         8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322         8760         1           GAS)         INSTALL INSUL JACKET         322         8760         1           ECO6 TOTAL:         CO5         1         1	Shower Heads         RESIDENTIAL TYPE         9.5 NO RETROFIT         9.5 245         1           Shower Heads         Systems Engineering and Management Corporation, Knoxville, TN	Shower Heads         Shower Heads         9.5 NO RETROFIT         9.5 245         1           ECOS TOTAL:         TEMP         TEMP         1           ECOS TOTAL:         TEMP         1           Water         CAPACITY: ?         325 REDUCE STORAGE TEMP         322 8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322 8760         1           (GAS)         ECOG TOTAL:         1         1           SYSTEMS CORP         Systems Engineering and Management Corporation, Knoxville, TN	ECO4 IOIAL:		-1					
## 15   TEMP   TEMP   TEMP   1   1   1   1   1   1   1   1   1	ECO5 TOTAL :         TEMP         TEMP         1           6         40 GAL RHEEM/FURY         325 REDUCE STORAGE TEMP 322 8760 1         1           Water CAPACITY: ?         INSTALL INSUL JACKET 322 8760 1         1           (GAS)         INSTALL INSUL JACKET 322 8760 1         1           ECO6 TOTAL :         A         1	SYSTEMS CORP   Systems Engineering and Management Corporation, Knoxville, TN   Shower neads   TEMP   TEMP	Systems   Coperation   Copera	5			4O RETROFIT	9.5	245	-	0
:       TEMP       1         40 GAL RHEEM/FURY       325 REDUCE STORAGE TEMP       322 8760       1         CAPACITY: ?       INSTALL INSUL JACKET       322 8760       1         RECOVERY: ?       INSTALL INSUL JACKET       322 8760       1         :       1       1       1	ECO5 TOTAL:         TEMP         TEMP         1           6         40 GAL RHEEM/FURY         325 REDUCE STORAGE TEMP         322 8760         1           Water         CAPACITY: ?         INSTALL INSUL JACKET         322 8760         1           (GAS)         ECO6 TOTAL:         1         1	ECO5 TOTAL:         TEMP         1         1           6         40 GAL RHEEM/FURY         325 REDUCE STORAGE TEMP         322 8760         1           Water         CAPACITY: ?         INSTALL INSUL JACKET         322 8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322 8760         1           GAS)         ECO6 TOTAL:         1         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, TN	ECO5 TOTAL:         TEMP         TEMP         1           6         40 GAL RHEEM/FURY         325 REDUCE STORAGE TEMP         322 8760         1           Water         CAPACITY: ?         INSTALL INSUL JACKET         322 8760         1           (GAS)         ECO6 TOTAL:         1         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, TN	Shower heads							
40 GAL RHEEM/FURY       325 REDUCE STORAGE TEMP       322 8760       1         CAPACITY: ?       INSTALL INSUL JACKET       322 8760       1         RECOVERY: ?       INSTALL INSUL JACKET       322 8760       1         :       1       1       1	6         40 GAL RHEEM/FURY         325 REDUCE STORAGE TEMP         322 8760         1           Water         CAPACITY: ?         1 INSTALL INSUL JACKET         322 8760         1           (GAS)         ECO6 TOTAL:         1 INSTALL INSUL JACKET         322 8760         1	6         40 GAL RHEEM/FURY         325 REDUCE STORAGE TEMP         322 8760         1           Water         CAPACITY: ?         325 REDUCE STORAGE TEMP         322 8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322 8760         1           GAS)         ECO6 TOTAL:         1         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, TN	6     40 GAL RHEEM/FURY     325 REDUCE STORAGE TEMP     322 8760     1       Water     CAPACITY: ?     325 REDUCE STORAGE TEMP     322 8760     1       Heater     RECOVERY: ?     INSTALL INSUL JACKET     322 8760     1       (GAS)     COSTOLE     1     1       ECOG TOTAL:     Asstems Engineering and Management Corporation, Knoxville, TN	ECO5 TOTAL:				TEMP		1	0
CAPACITY: ?       325 REDUCE STORAGE TEMP       322 8760       1         RECOVERY: ?       INSTALL INSUL JACKET       322 8760       1         :       1       1	Water         CAPACITY: ?         325         REDUCE STORAGE TEMP         322         8760         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322         8760         1           (GAS)         COG TOTAL:         COG TOTAL:         COG TOTAL:         COG TOTAL:         1	Water       CAPACITY: ?       325       REDUCE STORAGE TEMP       322       8760       1         Heater       RECOVERY: ?       INSTALL INSUL JACKET       322       8760       1         ECO6 TOTAL:       ECO6 TOTAL:       1       1     Systems Engineering and Management Corporation, Knoxville, TN	Water     CAPACITY: ?     325 REDUCE STORAGE TEMP     322 8760     1       Heater     RECOVERY: ?     INSTALL INSUL JACKET     322 8760     1       (GAS)     ECO6 TOTAL:     1     1       ECO6 TOTAL:     Systems Engineering and Management Corporation, Knoxville, TN	9							
RECOVERY: ?       INSTALL INSUL JACKET       322       8760       1         :       1       1       1	Heater         RECOVERY: ?         INSTALL INSUL JACKET         322         8760         1           (GAS)         ECO6 TOTAL:         1         1	Heater     RECOVERY: ?     INSTALL INSUL JACKET     322     8760     1       (GAS)     ECO6 TOTAL:     1     1       SYSTEMS CORP     Systems Engineering and Management Corporation, Knoxville, TN	Heater     RECOVERY: ?     INSTALL INSUL JACKET     322     8760     1       (GAS)     ECO6 TOTAL:     1     1       ECO6 TOTAL:     Systems Engineering and Management Corporation, Knoxville, TN	Water	l		STORAGE	322	8760	_	
	ECO6 TOTAL:	ECO6 TOTAL:  Systems Engineering and Management Corporation, Knoxville, TN	ECO6 TOTAL:  ECO6 TOTAL:  Systems Engineering and Management Corporation, Knoxville, TN	Heater	1		INSNI	322	8760	-	
	ECO6 TOTAL:	ECO6 TOTAL:  Systems Engineering and Management Corporation, Knoxville, TN	ECO6 TOTAL:  Systems Engineering and Management Corporation, Knoxville, TN	(GAS)							
		Systems Engineering and Management Corporation, Knoxville, TN	Systems Engineering and Management Corporation, Knoxville, TN	T + 0000 T		1					
		SYSTEMS CORP Systems Engineering and Management Corporation,	Systems Engineering and Management Corporation,	ECO6 TOTAL:							0
		Systems Engineering and Management Corporation,	Systems Engineering and Management Corporation,								
SYSTEMS CORP Systems Engineering and Management Corporation,			32	3 -3							

•	FY94S EEAP FT. KNOX	FT. KNO		ER CON	WATER CONS RVATION STUDY	TUDY	2 OF 2
		Ö	CALCULAT	TION WO	<b>CULATION WORK SHEET 2</b>		
FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
ECO Number	Annual Water	Annual	Energy	Saving	WATER	Total	Total
ECO Type	Saving LPY	ELEC KW	ELEC	GAS	Dollar Saving	Dollar Saving	Dollars Invested
1				0	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
3	188,340				\$78.16	\$78.16	\$418.80
Water Closets	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$418.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
5	0			0	\$0.00	\$0.00	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
9	EST ANNUAL						
Water	HOT WTR			0.25		\$2.66	
Heater	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS)						
	43,946						
ECO6 TOTAL:	43,946	0	0	8	\$0.00	\$83.63	\$60.00
SYSTEMS CORP	ORP			Systems	s Engineering and	d Management Cor	Systems Engineering and Management Corporation, Knoxville, TN
	1 1						

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT.		KNOX WATE CONSERVATION STUDY	S NOI	TUDY		10
	CALC	CULAT	CALCULATION WORK SHEET 1			DATE:	5 OCT 94
FACILITY NO. :	5314 D		FUNCTION:	,.	UNACCOM PERS HOUS	M PERS	HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:	ţ	24		
ECO Number	Existing Fixture System	1 1	Retrofited Fixture System	Ε	Usage	Fixtures	Water Leaks
ECO Type	Description	LPM	Description	LPM o 5	HRSWR 125	Quantity	Eliminated LPY
Lavatory Sinks		5.		2.	24	1	
FOOT TOTAL		DIM		MO		c	c
2 2	KITCHEN SINK	9.5	NO RETROFIT	9.5	365	1	0
Misc. Sinks							
ECO2 TOTAL:		LPF		LPF	#FL/YR	1	0
3	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	14600	1	
Water Closets			1 1				
ECO3 TOTAL:		LPF		LPF	#FL/YR	-	0
4							
Urinals							
ECO4 TOTAL:		LPM		LPM	HRS/YR	0	0
2	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.5	245	1	55640
Shower Heads							
ECOS TOTAL .		TEMP		TEMP		-	55640
9	40 GAL FURY						
Water	CAPACITY: ?	334	REDUCE STORAGE TEMP	322	8760	-	
Heater	RECOVERY: ?		INSTALL INSUL JACKET	322	8760	-	
(GAS)							
ECO6 TOTAL:		12.1		, 3/ 2 *		-	0

Systems Engineering and Management Corporation, Knoxville, TN

SYSTEMS CORP

	<b>FY94S EEAP FT. KNOX</b>	FT. KNO		WATER CONS	RVATION STUDY	TUDY	2 OF 2
		C	CALCULAT	TION WO			
FACILITY NO. :	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
5. 4.	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
ECO Number	Annual Water	Annual	Energy	Saving	WATER	Total	Total
ECO Type	Saving LPY	ELEC KW	ELEC KWH	GAS	Dollar Saving	Dollar Saving	Dollars Invested
1				0	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
3	188,340				\$78.16	\$78.16	\$418.80
Water Closets	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$418.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
2	55,640			96	\$23.09	\$1,034.18	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	55,640	0	0	96	\$23.09	\$1,034.18	\$0.00
9	EST ANNUAL						
Water	HOT WTR			0.89		\$9.37	
Heater	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS)						
	43,946						
ECO6 TOTAL:	43,946	0	0	6	\$0.00	\$90.33	\$60.00
<b>SYSTEMS CORP</b>	ORP			Systems	Engineering and	d Management Cor	Systems Engineering and Management Corporation, Knoxville, TN

Systems Engineering and Management Corporation, Knoxville, TN

Systems Engineering and Management Corporation, Knoxville, TN

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Saving GAS	CULATION WORK SHEET 2 \$/KL Energy Rate:		
Saving LPY KW   Control of the con	\$/MWH al Energy ELEC KWH	Saving	Energy Rate:		
Cas Rate: 10.51   Cas Rate:	al Energy ELEC KWH	Saving			\$/KWH
Number         Annual Water         Annual LPY           1         0      <	al Energy ELEC KWH	Saving	Demand Rate:		\$/KW
torype Saving LPY KW  tory Sinks 0  TOTAL: 0  sc. Sinks 0  TOTAL: 0  TOTAL: 0  sc. Sinks 0  TOTAL: 0  Jrinals 0  TOTAL: 0  A 0  Jrinals 0  wer Heads 0  TOTAL: 0  TOTA	ELEC KWH	GAS	WATER	Total	Total
tory Sinks 0  TOTAL: 0  sc. Sinks 0  TOTAL: 0		I ≥ ≥	Dollar Saving	Dollar Saving	Dollars Invested
tory Sinks 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0	\$0.00	\$0.00	\$0.00
10TAL: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0	\$0.00	\$0.00	\$0.00
TOTAL:       0       0         2       0       0         2       0       0         TOTAL:       0       0         er Closets       0       0         Prinals       0       0         Jrinals       0       0         TOTAL:       0       0         ser Heads       0       0         TOTAL:       0       0         EST ANNILIAI       0       0		0	\$0.00	\$0.00	\$0.00
2 0 0 sc. Sinks 0  TOTAL: 0 0 3 188,340  TOTAL: 188,340 4 0 Ininals 0 TOTAL: 0 wer Heads 0 TOTAL: 0 5 0 TOTAL: 0 5 0 TOTAL: 0 TOTAL: 0 5 0 TOTAL: 0 5 0		0	\$0.00	\$0.00	\$0.00
oc. Sinks 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0	\$0.00	\$0.00	\$0.00
TOTAL: 0  a		0	\$0.00	\$0.00	\$0.00
TOTAL: 0  3		0	\$0.00	\$0.00	\$0.00
3 188,340 er Closets 0  TOTAL: 0  Jrinals 0  TOTAL: 0  wer Heads 0  TOTAL: 0  TOTAL: 0  TOTAL: 0  TOTAL: 0  TOTAL: 0	0	0	\$0.00	\$0.00	\$0.00
TOTAL: 188,340  TOTAL: 188,340  4 0  Jrinals 0  TOTAL: 0  wer Heads 0  TOTAL: 0  TOTAL: 0  TOTAL: 0			\$78.16	\$78.16	\$838.80
TOTAL: 188,340  4 0  Jrinals 0  TOTAL: 0  wer Heads 0  TOTAL: 0  TOTAL: 0  TOTAL: 0			\$0.00	\$0.00	\$0.00
TOTAL: 188,340  4 0  Jrinals 0  TOTAL: 0  wer Heads 0  TOTAL: 0  TOTAL: 0  TOTAL: 0			\$0.00	\$0.00	\$0.00
0 0 0 0 ads 0 0 0			\$78.16	\$78.16	\$838.80
0 0 0 0 0 0 0 0 0 0 0			\$0.00	\$0.00	\$0.00
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			\$0.00	\$0.00	\$0.00
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			\$0.00	\$0.00	\$0.00
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			\$0.00	\$0.00	\$0.00
0 0 ::		0	\$0.00	\$0.00	\$0.00
0 0		0	\$0.00	\$0.00	\$0.00
: 0		0	\$0.00	\$0.00	\$0.00
F CCT ANNITAL	0	0	\$0.00	\$0.00	\$0.00
Ú					
Water HOT WTR		0.89		\$9.37	
00		7.70		\$80.96	\$60.00
(GAS) (LITERS)					
ECO6 TOTAL: 43,946 0	0	6	\$0.00	\$90.33	\$60.00
SYSTEMS CORP		Systems	Engineering and	d Management Cor	Systems Engineering and Management Corporation, Knoxville, TN

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT.		KNOX WAT CONSERVATION STUDY	S NO	TUDY		10
	CALCU	SULATI	LATION WORK SHEET 1			DATE:	5 OCT 94
FACILITY NO. :	7549 A&B		FUNCTION:	<b>-</b>	JNACCON	UNACCOM PERS HOUS	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:	1	24	2	0
ECO Number	Existing Fixture System		Retrofited Fixture System	r.	Usage	Fixtures	Water Leaks
ECO Type	Description	LPM	Description	LPM	<b>HRS/YR</b>	Quantity	Eliminated LPY
1 Lavatory Sinks	SINK W/ AERATOR	9.5	NO RETROFIT	9.5	125	-	
ECO1 TOTAL:		LPM		LPM		1	0
2 Misc. Sinks	KITCHEN SINK	9.5	NO RETROFIT	9.5	365	-	0
		i.		L	יינו אינו	•	d
ECO2 IOTAL:				77	#FL/YK	1	0
3 Water Closets	TANK TYPE	19 1	1.6 GPF TANK TYPE TOILET	6.1	7300	2	
TOTAL .		100		- סב	#61 // 10	c	c
LCCS TOTAL . 4 Urinals						1	
ECOA TOTAL .		MO		Md	HRS/VR	c	0
5	RESIDENTIAL TYPE	5.	NO RETROFIT	1	245		0
Shower Heads							
ECO5 TOTAL:		TEMP		TEMP		-	0
9	40 GAL RHEEM/FURY #354						
Water	CAPACITY: 48,000 BTU/H	331 F	REDUCE STORAGE TEMP	322	8760	-	
Heater (GAS)	RECOVERY: 40.3 GAL/H		INSTALL INSUL JACKET	322	8760	-	
		1					
ECO6 TOTAL:						-	0

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SYSTEMS CORP

	The state of the s	-		The state of the s			7 10 4
		CA	LCULAT	ION WOF	꽃		
FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
ECO Number	Annual Water	Annual	Energy	Saving	WATER	Total	Total
ECO Type	Saving LPY	ELEC	ELEC KWH	GAS	Dollar Saving	Dollar Saving	Dollars Invested
1	0			0	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
3	188,340				\$78.16	\$78.16	\$838.80
Water Closets	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$838.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
5	0			0	\$0.00	\$0.00	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
9	EST ANNUAL						
Water	HOT WTR			0.68		\$7.11	
Heater	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS)						
	43,946						
ECO6 TOTAL:	43,946	0	0	8	\$0.00	\$88.07	\$60.00
SYSTEMS CORP	JRP			Systems	Engineering and	Systems Engineering and Management Corporation,	poration, Knoxville, TN

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT	T. KN	KNOX WAT CONSERVATION STUDY	S NOI	TUDY		10
	CALC	CULAT				DATE:	5 OCT 94
FACILITY NO. :	7750 A		FUNCTION:	•	UNACCOM PERS HOU	N PERS I	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:	,	24	G G	0
ECO Number	Existing Fixture System		Retrofited Fixture System	Ε		Fixtures	Water Leaks
ECO Type 1	Description SINK W/ AERATOR	<b>LPM</b> 9.5	Description NO RETROFIT	L.P.M 9.5	HRS/YR 125	Quantity 1	Eliminated LPY
Lavatory Sinks							
ECO1 TOTAL:		LPM		LPM		1	0
2 Misc. Sinks	KITCHEN SINK	9.5	NO RETROFIT	9.5	365	-	0
ECO2 TOTAL:		LPF		LPF	#FL/YR	-	0
3 Water Closets	TANK TYPE		1.6 GPF TANK TYPE TOILET	6.1	14600	-	
1 1 0 0 0 0		-		7			
ECOS IOIAL:		귀		7	#FLITK	-	
Urinals							
ECO4 TOTAL:		LPM		LPM	HRS/YR	0	0
5 Shower Heads	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.5	245	1	222558
FCO5 TOTAL		TEMP	35 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	TEMP	\$ 1.00 miles	-	222558
9	40 GAL AMER. APP. #T-340						
Water Heater	CAPACITY: 30,000 BTU/H RECOVERY: 7.7 GAL/H	334	REDUCE STORAGE TEMP INSTALL INSUL JACKET	322	8760 8760		
(649)							
ECO6 TOTAL:						1	0

### SYSTEMS CORP

FACILITY NO.: Water Rate: 0.42 7750 A Gas Rate: 10.51 ECO Number Annual Water Annual ECO Type Saving LPY KW 1					
Gas Rate: Annual Water Saving LPY	\$/KL		Energy Rate:		\$/KWH
Annual Water  Saving LPY  0	#WW/\$		Demand Rate:		\$/KW
Saving LPY	Energy	Saving	WATER	Total	Total
Cavilly Er	ELEC	GAS	Dollar Cavina		Dollara Lacotad
	-	0	\$0.00	\$0.00	\$0.00
Lavatory Sinks 0		0	\$0.00	\$0.00	\$0.00
		0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL: 0 0 0	0	0	\$0.00	\$0.00	\$0.00
2 0		0	\$0.00	\$0.00	\$0.00
Misc. Sinks 0		0	\$0.00	\$0.00	\$0.00
0		0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL: 0 0 0	0	0	\$0.00	\$0.00	\$0.00
3 188,340			\$78.16	\$78.16	\$418.80
Water Closets 0			\$0.00	\$0.00	\$0.00
0			\$0.00	\$0.00	\$0.00
ECO3 TOTAL: 188,340			\$78.16	\$78.16	\$418.80
4 0			\$0.00	\$0.00	\$0.00
Urinals 0			\$0.00	\$0.00	\$0.00
0			\$0.00	\$0.00	\$0.00
ECO4 TOTAL: 0			\$0.00	\$0.00	\$0.00
5 222,558		385	\$92.36	\$4,136.66	\$0.00
Shower Heads 0		0	\$0.00	\$0.00	\$0.00
0		0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL: 222,558 0	0	385	\$92.36	\$4,136.66	\$0.00
Ē					
Water HOT WTR		0.89		\$9.37	
Heater CONSUMPTION		7.70		\$80.96	\$60.00
(GAS) (LITERS)					
ECO6 TOTAL: 43,946 0	0	6	\$0.00	\$90.33	\$60.00

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT.	T. KN	KNOX WAT CONSERVATION STUDY	S NO	TUDY		10
	CAL	CULAT	ス			DATE:	5 OCT 94
FACILITY NO.:	7751 C		FUNCTION:	- 11	UNACCOM PERS	UNACCOM PERS HOUS	HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:	'	24	5 ,	)
ECO Number	Existing Fixture System	- DW	Retrofited Fixture System	E I	Usage	Fixtures	Water Leaks
ECO 1ype	SINK W/ AERATOR	9.5	NO RETROFIT	9.5	125	1	
Lavatory Sinks							
ECO1 TOTAL:		LPM		Md J	26	-	0
2	KITCHEN SINK	9.5	NO RETROFIT	9.5	365	1	0
Misc. Sinks							
ECO2 TOTAL:		LPF		LPF	#FL/YR	1	0
3	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	14600	-	
Water Closets							
ECO3 TOTAL:		LPF		LPF	#FL/YR	-	0
4							
Urinals							
ECO4 TOTAL:		LPM		LPM	<b>HRS/YR</b>	0	0
5 Shower Heads	RESIDENTIAL TYPE	9.2	NO RETROFIT	9.5	245	-	0
ECO5 TOTAL:	OVO TIL GGA GTIMA INC. OLI	TEMP		TEMP		-	0
6 Water	40 GAL AMER. APP. #1-340 CAPACITY: 30 000 BTU/H	334	REDUCE STORAGE TEMP	322	8760	-	
Heater	RECOVERY: 7.7 GAL/H		INSTALL INSUL JACKET	322	8760	-	
(646)							
ECO6 TOTAL:		.x		9 14 15		¥2.7	0

SYSTEMS CORP

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Systems Engineering and Management Corporation, Knoxville, TN

FACILITY NO.   Water Rate:   0.42   \$/K/L   Energy Rate:   \$/K/WH   ELEC   GAS Rate:   10.51   \$/K/WH   ELEC   GAS Rate:   10.51   \$/K/WH   ELEC   GAS   ELEC   ELEC   GAS	CALCULATION WORK SHEET 2   CALCULATION WORK SHEET 2   CALCULATION WORK SHEET 2   S/K/L   Energy Rate:		FY94S EEAP FT. KNOX	T. KNO		WATER CONS	RVATION STUDY	TUDY	2 OF 2
Cas Rate:         0.42         \$/K/L         Energy Rate:         \$/K/L         Energy Rate:         \$/K/L           Cas Rate:         10.51         \$/M/M         Demand Rate:         \$/K/L           Per Annual Water         Annual Energy Annual Energy Saving         WATER         Total         \$/K/L           Per Saving LPY         KW         KWH         MWH         Dollar Saving         \$0.00         \$0.00           Iks         0         0         \$0.00	Saving LPY KW KWH   Cas Rate:   10.51 \$/MWH			CA	LCULAT	ION WOL	R SHEET 2		
Number         Annual Water         Annual ELEC         GAS         WATER         Total         \$KW           Number         Annual Water         Annual Mater         Annual ELEC         GAS         WATER         Total         \$KW         Total         Total         \$KW         \$KWH         MWH         Dollar Saving         \$KW         \$KW         \$KWH         <	Number	FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
O Number         Annual Water         Annual Energy Saving LPY         RANH         MWH         Dollar Saving Dollar Saving S0.00         Total           1 O Type         Saving LPY         KWH         MWH         Dollar Saving Dollar Saving S0.00         \$0.00           1 O Type         Saving LPY         KWH         MWH         Dollar Saving S0.00         \$0.00           1 O Type         0         0         \$0.00         \$0.00         \$0.00           1 O Type         0         0         \$0.00         \$0.00         \$0.00           2 C D O O O D S0.00         0         \$0.00         \$0.00         \$0.00         \$0.00           2 C SINKS O O O O D S0.00         0         \$0.00         \$0.00         \$0.00         \$0.00           2 C SINKS O O D O D S0.00         0         \$0.00         \$0.00         \$0.00         \$0.00           2 C SINKS O D S0.00         0         \$0.00         \$0.00         \$0.00         \$0.00           3 S SINKS O D S0.00         0         \$0.00         \$0.00         \$0.00         \$0.00           4 A D D TAL:         0         0         \$0.00         \$0.00         \$0.00           4 S S S O D D S0.00         0         \$0.00         \$0.00         \$0.00	O Number         Annual Water         Annual ELEC         EL		Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
CO Type         Saving LPY         FLEC RWH         GAS PS.0.00         Sp.0.00	COType   Saving LPY KW KWH   LPCY Sinks	ECO Number	Annual Water	Annual	Energy	Saving	WATER	Total	Total
tory Sinks         0         50.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00         \$0.00         \$0.00           ac Closets         0         0         0         \$0.00         \$0.00           ac Closets         0         0         \$0.00         \$0.00         \$0.00           At DIAL:         0         \$0.00         \$0.00         \$0.00         \$0.00           b         0         \$0.00         \$0.00         \$0.00         \$0.00           D         0         \$0.00         \$0.00         \$0.00         \$0.00           E         0	tory Sinks 0  TOTAL: 0  Sc. Sinks 0  TOTAL: 0	ECO Type		ELEC	ELEC	GAS	Dollar Saving	Dollar Saving	Dollars Invested
tory Sinks         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00         \$0.00           TOTAL:         188,340         0         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00         \$0.00           At         0         \$0.00         \$0.00         \$0.00         \$0.00           At         0         \$0.00         \$0.00         \$0.00         \$0.00           5         0         0         \$0.00         \$0.00         \$0.00           5         0         0         \$0.00         \$0.00         \$0.00           6         ESTANNUAL         0.089         \$0.00         \$0.00         \$0.00 <td>tory Sinks 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>1</td> <td></td> <td></td> <td></td> <td>0</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td>	tory Sinks 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1				0	\$0.00	\$0.00	\$0.00
TOTAL:         0         0         \$0.00         \$0.00           2         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00         \$0.00           E         CITERS)         43,946	TOTAL:         0         0         0           2         0         0         0           2         0         0         0           2         0         0         0           TOTAL:         0         0         0           TOTAL:         0         0         0           TOTAL:         0         0         0           TOTAL:         0         0         0           Wer Heads         0         0         0           TOTAL:         0         0         0           FET ANNUAL         0         0         0           GASI         (LITERS)         43,946         0         0           TOTAL:         43,946         0         0         0           TOTAL:         43,946         0         0         0	Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
TOTAL:         0         0         0         \$0.00         \$0.00           2         0         0         \$0.00         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         0         0         0         \$0.00         \$0.00         \$0.00         \$0.00           scr Closets         0         0         0         \$0.00 <t< td=""><td>TOTAL:         0         0         0           2         0         0         0           2         0         0         0           TOTAL:         0         0         0           TOTAL:         188,340         0         0           TOTAL:         0         0         0           TOTAL:         0         0         0           TOTAL:         0         0         0           wer Heads         0         0         0           TOTAL:         0         0         0           Water         HOT WITR         HOT WITR         HOT WITR           Heater         CONSUMPTION         43,946         0         0           GAS)         (LITERS)         43,946         0         0           TOTAL:         43,946         0         0         0</td><td></td><td>0</td><td></td><td></td><td>0</td><td>\$0.00</td><td>\$0.00</td><td>\$0.00</td></t<>	TOTAL:         0         0         0           2         0         0         0           2         0         0         0           TOTAL:         0         0         0           TOTAL:         188,340         0         0           TOTAL:         0         0         0           TOTAL:         0         0         0           TOTAL:         0         0         0           wer Heads         0         0         0           TOTAL:         0         0         0           Water         HOT WITR         HOT WITR         HOT WITR           Heater         CONSUMPTION         43,946         0         0           GAS)         (LITERS)         43,946         0         0           TOTAL:         43,946         0         0         0		0			0	\$0.00	\$0.00	\$0.00
2         0         \$0.00         \$0.00           sc. Sinks         0         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00           Valuals         0         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00           F         0         \$0.00         \$0.00           Water Heads         0         \$0.00         \$0.00           COTAL:         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           6         \$0.00         \$0.00         \$0.00           6         \$0.00         \$0.00         \$0.00           6         \$0.00         \$0.00         \$0.00           6         \$0.00         \$0.00         \$0.00           8         \$0.00         \$0.00	2         0           sc. Sinks         0         0           TOTAL:         0         0           3         188,340         0           ar Closets         0         0           TOTAL:         188,340         0           4         0         0           TOTAL:         0         0           FOTAL:         0         0           TOTAL:         0         0           Wer Heads         0         0           FOTAL:         0         0           GASH:         HOT WIR         0           GASI Heater         CONSUMPTION         0           GASI (GAS)         (LITERS)         43,946         0           TOTAL:         43,946         0         0	ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
sc. Sinks         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           Jrinals         0         \$0.00         \$0.00         \$0.00           Jrinals         0         \$0.00         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00           Warer Heads         0         \$0.00         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00         \$0.00           E ST ANNUAL         0         \$0.00         \$0.00         \$0.00           GAS)         (LITERS)         \$0.00         \$0.00         \$0.00           A3,946         0         \$0.00         \$0.00         \$0.00           TOTAL:         43,946         0         \$0.00         \$0.00           B         \$0.00         \$0.00         \$0.00         \$0.00           B         \$0.00         \$	sc. Sinks         0         0           3         188,340         0           3         188,340         0           4         0         0           TOTAL:         0         0           TOTAL:         0         0           wer Heads         0         0           TOTAL:         0         0           FOTAL:         0         0           Warer Heads         0         0           Water         HOT WITR         HOT WITR           Heater         CONSUMPTION         43,946           (GAS)         (LITERS)         43,946         0           TOTAL:         43,946         0         0	2	0			0	\$0.00	\$0.00	\$0.00
TOTAL:         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           3         188,340         \$0.00         \$0.00         \$0.00           Foldar:         0         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           Jrinals         0         \$0.00         \$0.00         \$0.00           Jrinals         0         \$0.00         \$0.00         \$0.00           Follows         \$0.00         \$0.00         \$0.00         \$0.00           GAS)         (LITERS) <th< td=""><td>TOTAL:         0         0         0           3         188,340         0         0           ar Closets         0         0         0           TOTAL:         188,340         0         0           TOTAL:         0         0         0           ser Heads         0         0         0           wer Heads         0         0         0           TOTAL:         0         0         0           wer Heads         0         0         0           Gency Heads         0         0         0           Gast Annual         0         0         0           Gast Annual         0         0         0           GAS         CLITERS)         43,946         0         0           TOTAL:         43,946         0         0         0           TOTAL:         43,946         0         0         0</td><td>Misc. Sinks</td><td>0</td><td></td><td></td><td>0</td><td>\$0.00</td><td>\$0.00</td><td>\$0.00</td></th<>	TOTAL:         0         0         0           3         188,340         0         0           ar Closets         0         0         0           TOTAL:         188,340         0         0           TOTAL:         0         0         0           ser Heads         0         0         0           wer Heads         0         0         0           TOTAL:         0         0         0           wer Heads         0         0         0           Gency Heads         0         0         0           Gast Annual         0         0         0           Gast Annual         0         0         0           GAS         CLITERS)         43,946         0         0           TOTAL:         43,946         0         0         0           TOTAL:         43,946         0         0         0	Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
TOTAL:         0         0         \$0.00         \$0.00           3         188,340         \$0.00         \$78.16         \$78.16           er Closets         0         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           Jrinals         0         \$0.00         \$0.00         \$0.00           Follow         \$0.00         \$0.00         \$0.00         \$0.00           Wer Heads         0         0         \$0.00         \$0.00           E         EST ANNUAL         0         \$0.00         \$0.00           GAS)         (LITERS)         7.70         \$0.00         \$0.00           GAS)         (LITERS)         \$0.00         \$0.00         \$0.00           A3,946         0         0         \$0.00         \$0.00           B         \$0.00	TOTAL:         0         0         0           3         188,340         0         0           TOTAL:         188,340         0         0           TOTAL:         0         0         0           TOTAL:         0         0         0           Formals         0         0         0           TOTAL:         0         0         0           Wer Heads         0         0         0           Formal         HOT WIR         0         0           Water         HOT WIR         HOT WIR         0           GAS)         (LITERS)         43,946         0         0           TOTAL:         43,946         0         0           TOTAL:         43,946         0         0		0			0	\$0.00	\$0.00	\$0.00
188,340         \$78.16         \$78.16           \$15         0         \$0.00         \$0.00           \$15         0         \$0.00         \$0.00           \$15         \$15         \$20.00         \$20.00           \$15         \$20         \$20         \$20         \$20           \$15         \$20         <	188,340  188,340  0 188,340  0 0 0 0 0 0 0 0 EST ANNUAL HOT WTR CONSUMPTION (LITERS) 43,946  5 CORP		0	0	0	0	\$0.00	\$0.00	\$0.00
ets         0         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           EST ANNUAL         \$0.89         \$0.00         \$0.00           HOT WITE         \$0.89         \$0.00         \$0.00           (LITERS)         7.70         \$0.00         \$0.00           43,946         0         9         \$0.00           43,946         0         9         \$0.00	ets 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	က	188,340				\$78.16	\$78.16	\$418.80
0         \$0.00         \$0.00           188,340         \$78.16         \$78.16           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           EST ANNUAL         \$0.89         \$0.00           HOT WIR         \$0.89         \$0.00           CONSUMPTION         7.70         \$80.96           (LITERS)         \$0.00         \$80.00           43,946         0         9         \$90.33	188,340 0 0 0 0 0 0 0 0 0 EST ANNUAL HOT WTR CONSUMPTION (LITERS) 43,946 5 CORP	Water Closets	0				\$0.00	\$0.00	\$0.00
188,340         \$78.16         \$78.16           0         0         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           ds         0         0         \$0.00         \$0.00           consumption         0         \$0.00         \$0.00         \$0.00           HOT WITA         0.89         \$0.00         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96         \$0.37           43,946         0         0         \$0.00         \$0.33	188,340 0 0 0 0 0 0 0 0 0 0 0 0 0		0				\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00           0         \$0.00         \$0.00           color         \$0.00         \$0.00           ads         0         \$0.00         \$0.00           color         \$0.00         \$0.00         \$0.00           color         \$0         \$0.00         \$0.00           color         \$0         \$0.00         \$0.00           color         \$0.00         \$0.00         \$0.00	0 0 0 i 0 0 ads 0 0 0 0 EST ANNUAL HOT WTR CONSUMPTION (LITERS) 43,946 0 0 0 S CORP	ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$418.80
0         \$0.00         \$0.00           1         0         \$0.00         \$0.00           ads         0         \$0.00         \$0.00           ads         0         0         \$0.00         \$0.00           1         0         0         \$0.00         \$0.00           2         0         0         \$0.00         \$0.00           2         0         0         \$0.00         \$0.00           3         0         0         \$0.00         \$0.00           40T WITA         0.89         \$0.00         \$0.00           43,946         0         0         \$0.00         \$0.00           43,946         0         0         \$0.00         \$0.00	0   0   0   0   0   0   0   0   0   0	4	0				\$0.00	\$0.00	\$0.00
i         0         \$0.00         \$0.00           ads         0         \$0.00         \$0.00           ads         0         \$0.00         \$0.00           i         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WTR         0.89         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96           43,946         0         9         \$0.00         \$90.33	-: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Urinals	0				\$0.00	\$0.00	\$0.00
.:         0         \$0.00         \$0.00           ads         0         \$0.00         \$0.00           :         0         \$0.00         \$0.00           :         0         0         \$0.00         \$0.00           :         0         0         \$0.00         \$0.00           :         EST ANNUAL         0         0         \$0.00         \$0.00           HOT WTR         0.89         \$0.00         \$0.37         1           CONSUMPTION         7.70         \$80.96         1           43,946         0         9         \$0.00         \$0.33	is described by the state of th		0				\$0.00	\$0.00	\$0.00
ads         0         \$0.00         \$0.00           ads         0         \$0.00         \$0.00           .:         0         0         \$0.00         \$0.00           .:         0         0         \$0.00         \$0.00           EST ANNUAL         0         0         \$0.00         \$0.00           HOT WIR         0.89         \$0.00         \$9.37           CONSUMPTION         7.70         \$80.96           43,946         0         9         \$0.00         \$90.33	ads 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
ads         0         \$0.00         \$0.00           :         0         0         \$0.00         \$0.00           :         0         0         \$0.00         \$0.00           EST ANNUAL         0.89         \$0.00         \$0.37           HOT WTR         0.89         \$9.37           CONSUMPTION         7.70         \$80.96           43,946         0         9         \$0.00         \$90.33	ads 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5	0			0	\$0.00	\$0.00	\$0.00
.:         0         \$0.00         \$0.00           .:         0         0         \$0.00         \$0.00           EST ANNUAL         0.89         \$0.00         \$0.37           HOT WTR         7.70         \$80.96           CONSUMPTION         7.70         \$80.96           43,946         0         9         \$0.00         \$90.33	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Shower Heads	0			0	\$0.00	\$0.00	\$0.00
-:         0         0         \$0.00         \$0.00           EST ANNUAL         0.89         \$9.37           HOT WTR         7.70         \$80.96           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         9         \$0.00         \$90.33	-: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0			0	\$0.00	\$0.00	\$0.00
EST ANNUAL         0.89         \$9.37           HOT WTR         7.70         \$80.96           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         9         \$0.00         \$90.33	ANNUAL  T WTR  SUMPTION  ITERS)  3,946  3,946  0  0	ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
HOT WTR         0.89         \$9.37           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         9         \$0.00         \$90.33	3,946 0 0	9	EST ANNUAL						
CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         9         \$0.00         \$90.33	3,946 0 0	Water	HOT WTR			0.89		\$9.37	
(LITERS) 43,946 0 0 9 \$0.00 \$90.33	3,946 0 0	Heater	CONSUMPTION			7.70		\$80.96	\$60.00
43,946 0 0 9 \$0.00 \$90.33	3,946 0 0	(GAS)	(LITERS)						
43,946 0 0 9 \$0.00 \$90.33	3,946 0 0		43,940						
		ECO6 TOTAL:	43,946	0	0	6	\$0.00	\$90.33	\$60.00

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT	. KNOX WAT	CONSERVATION STUDY	SNC	ruby		10
	CALC	ULATION WORK				DATE:	5 OCT 94
FACILITY NO.:	7821 B	FUN	FUNCTION:	∠ار	JNACCON	I PERS I	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY	Operating Hours:	Hours:		24 24	24 Z4	0
ECO Number ECO Type	Existing Fixture System Description	Retrofited Fixture LPM Description	System	Md	Usage HRS/YR	Fixtures	Water Leaks Eliminated LPY
1 Lavatory Sinks	SINK W/ AERATOR	NO RETE		9.5	125	1	
ECO1 TOTAL:		<b>Nd</b> .		Md		·	0
2 Misc. Sinks	KITCHEN SINK	9.5 NO RETROFIT		9.5	365	-	0
ECO2 TOTAL:		LPF		LPF	#FL/YR	-	0
3 Water Closets	TANK TYPE	1.6 GPF TANK 1	YPE TOILET	6.1	14600	-	
ECO3 TOTAL:		LPF		LPF	#FL/YR	1	0
4 Urinals							
ECO4 TOTAL:	3 4	LPM		LPM	HRS/YR	0	0
5 Shower Heads	RESIDENTIAL TYPE	11.4 NO RETROFIT		11.4	245	-	0
ECO5 TOTAL:		TEMP		TEMP		-	0
6 Water	40 GAL RHEEM/FURY CAPACITY: ?	336 REDUCE STORAGE TEMP		322	8760	-	
Heater (GAS)	RECOVERY: ?	INSTALL INSUL JACKET		322	8760	-	
ECO6 TOTAL:						1	0
SYSTEMS CORP	ORP	Systems Engineering and Management Corporation,	Managem	ent Co	rporation	, Knoxville, TN	lle, TN
		,	>		•		

Systems Engineering and Management Corporation, Knoxville, TN

		FY94S EEAP FT. KNOX	T. KNO		ER CON	WATER CON: RVATION STUDY	rudy	2 OF 2
Cas Rate:         0.42         \$/KL         Energy Rate:         \$/KV           Gas Rate:         10.51         \$/MWH         Demand Rate:         \$/KV           Fundal Water         Annual Energy Annual Energy Saving         WATER         Total         \$/KW           e         Saving LPY         KW         KWH         MWH         Dollar Saving         \$/LOO         \$/			73	LCULAT	ION NOI	RK SHEET 2		
Gas Rate:         10.51         \$\text{MWMH}\$         Demand Rate:         \$\text{ATCR}\$         \$\text{SMWH}\$         \$\text{SMWH}\$         \$\text{Dollar Saving}\$         \$\text{SMWH}\$         \$\text{MATER}\$         \$\text{Total}\$         \$\text{SMM}\$         \$\text{SMM}\$         \$\text{Collar Saving}\$         \$\text{SMM}\$         \$\text{SMM}\$         \$\text{Dollar Saving}\$         \$\text{SMM}\$         \$\text{SMM}\$         \$\text{Dollar Saving}\$         \$\text{SMM}\$         \$\text{Dollar Saving}\$         \$\text{SMM}\$         \$\text{SMM}\$         \$\text{Dollar Saving}\$         \$\text{SMM}\$         \$\text{SMM}\$         \$\text{Dollar Saving}\$         \$\text{SMM}\$         \$\te	FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
saving         Annual Water         Annual Energy Saving         WATER         Total           ks         C         CAS         Saving         LEC         ELEC         GAS           ks         C         C         S0.00         \$0.00         \$0.00           c         C         C         C         \$0.00         \$0.00         \$0.00           c         C         C         C         \$0.00	2	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
ks         ELEC         ELEC         GAS         Dollar Saving         Dollar Saving           ks         0         0         50.00         \$0.00           c         0         0         \$0.00         \$0.00           c         0         \$0.00         \$0.00         \$0.00 <t< td=""><td>ECO Number</td><td>Annual Water</td><td>Annual</td><td>Energy</td><td>Saving</td><td>WATER</td><td>Total</td><td>Total</td></t<>	ECO Number	Annual Water	Annual	Energy	Saving	WATER	Total	Total
Ke	ECO Type		ELEC	ELEC KWH	GAS	Dollar Saving	Dollar Saving	Dollars Invested
Ks   0   0   \$0.00   \$0.00	-				0	\$0.00	\$0.00	\$0.00
0         0         \$0.00         \$0.00           s         0         \$0.00         \$0.00           s         0         \$0.00         \$0.00           s         0         \$0.00         \$0.00           s         0         \$0.00         \$0.00           sts         0         \$0.00         \$0.00           sts         0         \$0.00         \$0.00           sts         0         \$0.00         \$0.00           s         0         \$0.00         \$0.00           d         \$0.00         \$0.00         \$0.00           d         \$	Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
s         0         0         \$0.00         \$0.00           s         0         \$0.00         \$0.00         \$0.00           d         0         \$0.00         \$0.00         \$0.00           EST ANNUAL         1.10         \$0.00         \$0.00         \$0.00           EST ANNUAL         1.10         \$0.00         \$0.00         \$0.00           CONSUMPTION         7.70         \$0.00         \$0.00           43,946         0         0         \$0.00         \$0.00           43,946         0         0         \$0.00         \$0.00		0			0	\$0.00	\$0.00	\$0.00
s         0         \$0.00         \$0.00           s         0         \$0.00         \$0.00           to         0         \$0.00         \$0.00           ts         0         0         \$0.00           ts         0         \$0.00         \$0.00           ts         0         \$0.00         \$0.00           ts         0         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           est Annual         \$0.00         \$0.00         \$0.00           EST ANNUAL         1.10         \$0.00         \$0.00           HOT WTR         1.10         \$0.00         \$0.00           CONSUMPTION         7.70         \$0.00         \$0.00           43,946         0         \$0.00         \$0.00         \$0.00           43,946         0         \$0.00         \$0.00         \$0.00	ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
s         0         \$0.00         \$0.00           to         0         \$0.00         \$0.00           tes         0         0         \$0.00         \$0.00           tes         0         0         \$0.00         \$0.00         \$0.00           tes         0         0         \$0.00         \$0.00         \$0.00         \$0.00           tes         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           tes         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           ds         0         0         \$0.00         \$0.00         \$0.00         \$0.00           tes         0         0         \$0.00         \$0.00         \$0.00         \$0.00           ds         0         0         \$0.00         \$0.00         \$0.00         \$0.00           tes         0         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           tes         0         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           tes         0         0         \$0.00         \$0.00         \$0.00         \$0.00	2	0			0	\$0.00	\$0.00	\$0.00
0         0         \$0.00         \$0.00           its         0         0         \$0.00         \$0.00           its         0         0         \$0.00         \$0.00           its         0         \$0.00         \$0.00         \$0.00           its	Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
its         0         0         \$0.00         \$0.00           its         0         \$78.16         \$78.16         \$78.16           its         0         \$0.00         \$0.00         \$0.00           its         0         \$0.00         \$0.00         \$0.00           188,340         \$0         \$0.00         \$0.00         \$0.00           0         \$0         \$0.00         \$0.00         \$0.00           0         \$0         \$0.00         \$0.00         \$0.00           ds         \$0         \$0.00         \$0.00         \$0.00           ESTANNUAL         \$0         \$0.00         \$0.00         \$0.00           HOT WIR         1.10         \$0.00         \$0.00         \$0.00           CONSUMPTION         7.70         \$0.00         \$0.00         \$0.00           43,946         0         0         \$0.00         \$0.00         \$0.00           43,946         0         0         \$0.00         \$0.00         \$0.00         \$0.00		0			0	\$0.00	\$0.00	\$0.00
its         188,340         \$78.16         \$78.16           its         0         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           EST ANNUAL         1.10         \$0.00         \$0.00           HOT WIR         1.10         \$0.00         \$0.00           CONSUMPTION         7.70         \$0.00         \$0.00           43,946         0         9         \$0.00         \$92.57	ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
tfs         0         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           est Annual         0         \$0.00         \$0.00           EST ANNUAL         1.10         \$0.00         \$0.00           HOT WITE         1.10         \$0.00         \$0.00           CONSUMPTION         7.70         \$0.00         \$0.00           43,946         0         9         \$0.00         \$0.00	3	188,340				\$78.16	\$78.16	\$418.80
0         \$0.00         \$0.00           188,340         \$78.16         \$78.16           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           est annual         0         \$0.00           est annual         0         \$0.00           est annual         1.10         \$0.00           consumption         7.70         \$80.96           (LITERS)         7.70         \$80.96           43,946         0         9         \$0.00	Water Closets	0				\$0.00	\$0.00	\$0.00
188,340         \$78.16         \$78.16           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           est annual         0         \$0.00         \$0.00           EST ANNUAL         1.10         \$0.00         \$0.00           HOT WTR         1.10         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96           (LITERS)         43.946         0         9         \$0.00         \$92.57		0				\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00           0         \$0.00         \$0.00           4s         \$0.00         \$0.00           4s         \$0.00         \$0.00           4s         0         \$0.00         \$0.00           4s         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WTR         1.10         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96           43,946         0         9         \$0.00           43,946         0         9         \$0.00	ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$418.80
0         \$0.00         \$0.00           0         \$0.00         \$0.00           4s         0         \$0.00         \$0.00           4s         0         \$0.00         \$0.00           4s         0         0         \$0.00         \$0.00           EST ANNUAL         0         0         \$0.00         \$0.00           HOT WTR         1.10         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96           43,946         0         9         \$0.00         \$92.57	4	0				\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00           4s         0         \$0.00         \$0.00           4s         0         \$0.00         \$0.00           4s         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WTR         1.10         \$0.00         \$0.00           CONSUMPTION         7.70         \$11.61           43,946         0         9         \$0.00         \$92.57	Urinals	0				\$0.00	\$0.00	\$0.00
4s         0         \$0.00         \$0.00           4s         0         \$0.00         \$0.00           4s         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WTR         1.10         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96           43,946         0         9         \$0.00         \$92.57		0				\$0.00	\$0.00	\$0.00
ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           est Annual         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00         \$0.00           HOT WTR         1.10         \$1.10         \$11.61         \$1.151           CONSUMPTION         7.70         \$80.96         \$43,946         0         9         \$0.00         \$92.57	ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
4s         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WTR         1.10         \$11.61           CONSUMPTION         7.70         \$80.96           (LITERS)         7.70         \$80.96           43,946         0         \$0.00         \$0.00	2	0			0	\$0.00	\$0.00	\$0.00
0         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           EST ANNUAL         1.10         \$11.61           HOT WTR         7.70         \$80.96           CONSUMPTION         7.70         \$80.96           43,946         0         \$0.00         \$0.00	Shower Heads	0			0	\$0.00	\$0.00	\$0.00
0         0         0         \$0.00         \$0.00           EST ANNUAL HOT WTR CONSUMPTION         1.10         \$11.61           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         9         \$0.00         \$92.57		0			0	\$0.00	\$0.00	\$0.00
EST ANNUAL         1.10         \$11.61           HOT WTR         7.70         \$80.96           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         9         \$0.00         \$92.57	ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
HOT WTR         1.10         \$11.61           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         9         \$0.00         \$92.57	9	EST ANNUAL						
CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         9         \$0.00         \$92.57	Water	HOT WTR			1.10		\$11.61	
(LITERS) 43,946 0 0 9 \$0.00 \$92.57	Heater	CONSUMPTION			7.70		\$80.96	\$60.00
43,946     0     9     \$0.00     \$92.57	(GAS)	(LITERS)						
43,946 0 0 9 \$0.00 \$92.57		43,946						
	ECO6 TOTAL:	43,946	0	0	6	\$0.00	\$92.57	\$60.00

Systems Engineering and Management Corporation, Knoxville, TN

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	FY94S EEAP F	T KN	F KNOX WAT CONSERVATION STUDY	S NOI	TUDY		10
	CAL	CULA	X			DATE:	5 OCT 94
FACILITY NO. :	7869 A		FUNCTION:	,	UNACCOM PERS HOU	A PERS	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:		24 24	5	0
ECO Number	Existing Fixture System	_	Retrofited Fixture System	E	Usage	Fixtures	Water Leaks
ECO Type	Description		Description	LPM	HRS/YR	Quantity	Eliminated LPY
1 avatory Sinke	SINK W/ AERATOR	9.5	NO RETROFII	ည က က	125		
Lavatory office		7.7.		5	031	-	
ECO1 TOTAL:		LPM		LPM		2	0
2 Misc. Sinks	KITCHEN SINK	9.5	NO RETROFIT	9.5	365	1	0
ECO2 TOTAL:		LPF		LPF	#FL/YR	-	0
3 Water Closets	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	7300		
ECO3 TOTAL:		LPF		LPF	#FL/YR	2	0
4 Urinals							
ECO4 TOTAL:		LPM		LPM	HRS/YR	0	0
5 Shower Heads	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.5	245	-	0
ECO5 TOTAL:		TEMP		TEMP		7	0
9	40 GAL RHEEM						
Water Heater	CAPACITY: 30,000 BTU/H RECOVERY: ?	332	REDUCE STORAGE TEMP INSTALL INSUL JACKET	322 322	8760		
(643)							
ECO6 TOTAL:					\$4. 32.54	1	0

SYSTEMS CORP

FACILITY NO.:         Water Rate:         0.42         \$/K/L         Energy Rate:         \$/KWH           7869 A         Gas Rate:         10.51         \$/MWH         Demand Rate:         \$/KWH           ECO Number         Annual Water         Annual Energy Saving         WATER         Total         Total           ECO Type         Saving LPY         KW         KWH         MWH         Dollar Saving         Dollar Saving         Dollar Saving         Dollar Saving         Dollars Invested           ECOT TOTAL:         99,000         0         171         \$41,09         \$1,840,10         \$5,00           ECOT TOTAL:         99,000         0         171         \$41,09         \$1,840,10         \$5,00           ECOT TOTAL:         99,000         0         171         \$41,09         \$1,840,10         \$5,00           Misc. Sinks         0         0         0         0         \$5,00         \$5,00         \$5,00           ECOZ TOTAL:         0         0         0         0         \$5,00         \$5,00         \$5,00           Water Closels         0         0         \$1,00         \$1,00         \$1,00         \$1,00         \$1,00           ECO3 TOTAL:         0         0 <th>Water Rate:         0.42         \$/KL         Energy Rate:         \$/KWH           Gas Rate:         10.51         \$/MWH         Demand Rate:         \$/KWH           Annual Water         Annual Energy Saving Opension of Control on the Contr</th> <th>Rate:         0.42         \$/KL           tate:         10.51         \$/MWH           ual Water         Annual Energy S         ELEC           ual Water         Company         Company           ual Company         Company         Company     <th></th><th>CAL</th><th>CAL</th><th>LCULAT</th><th>ION WO</th><th>CULATION WORK SHEET 2</th><th></th><th></th></th>	Water Rate:         0.42         \$/KL         Energy Rate:         \$/KWH           Gas Rate:         10.51         \$/MWH         Demand Rate:         \$/KWH           Annual Water         Annual Energy Saving Opension of Control on the Contr	Rate:         0.42         \$/KL           tate:         10.51         \$/MWH           ual Water         Annual Energy S         ELEC           ual Water         Company         Company           ual Company         Company         Company <th></th> <th>CAL</th> <th>CAL</th> <th>LCULAT</th> <th>ION WO</th> <th>CULATION WORK SHEET 2</th> <th></th> <th></th>		CAL	CAL	LCULAT	ION WO	CULATION WORK SHEET 2		
Number   Annual Water   Annual Energy Saving   Number   Annual Water   ELEC   ELEC   GAS   S0.00   S	Lal Water    10.51 \$/MWH	Lal Water Annual Energy S  al Water Annual Energy S  BLEC ELEC ELEC ELEC ELEC ELEC ELEC ELEC	FACILITY NO. :	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
O Number         Annual Water         Annual Energy Saving LPY         Annual Energy Saving LPY         Annual Energy Saving ELEC         Total	ng         LPY         KW         KWH           0         0         0           9,000         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           ANNUAL         0         0           3,946         0         0	ng         LPY         KW         KWH           0         0         0           9,000         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           ANNUAL         0         0           1TERS)         3,946         0           3,946         0         0		Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
CO Type         Saving LPY         ELEC RWH         GAS POLOG         SOLOG         SOLOG           10 YSinks         99,000         0         171         \$41.09         \$1840.10           10 YSINks         99,000         0         0         \$0.00         \$0.00           10 YOTAL:         99,000         0         0         \$50.00         \$1840.10           5c. Sinks         0         0         0         \$50.00         \$0.00           5c. Sinks         0         0         0         \$50.00         \$0.00           TOTAL:         0         0         \$50.00         \$0.00         \$0.00           3 Sinks         0         0         \$50.00         \$0.00         \$0.00           4         0         0         \$50.00         \$0.00         \$0.00         \$0.00           1 COTAL:         0         0         \$50.00         \$0.00	ng         LPY         KW         KWH           0         0         0           9,000         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           ANNUAL         0         0           OT WR         0         0           ANNUAL         0         0           XUMPTION         3,946         0           3,946         0         0	ng         LPY         KW         KWH           0         0         0           9,000         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           ANNUAL         0         0           OT WR         0         0           3,946         0         0           3,946         0         0	ECO Number	Annual Water	Annual		Saving	WATER	Total	Total
1 tory Sinks         99,000         171         \$41.09         \$1,840.10           TOTAL:         99,000         0         171         \$41.09         \$1,840.10           2 c. Sinks         0         0         0         \$50.00         \$50.00           sc. Sinks         0         0         0         \$50.00         \$50.00           ac. Sinks         0         0         0         \$50.00         \$50.00           ac. Sinks         0         0         0         \$50.00         \$50.00           ac. Sinks         0         0         \$50.00         \$50.00           ac. Closets         0         0         \$50.00         \$50.00           TOTAL:         0         \$50.00         \$50.00         \$50.00           b         0         \$50.00         \$50.00         \$50.00           b         0         \$50.00         \$50.00         \$50.00           b <td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>ECO Tyne</td> <td></td> <td></td> <td>ELEC</td> <td>GAS</td> <td>Dollar Saving</td> <td>Dollar Saving</td> <td>Dollare Invested</td>	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ECO Tyne			ELEC	GAS	Dollar Saving	Dollar Saving	Dollare Invested
rtory Sinks         99,000         171         \$41,09         \$1,840.10           TOTAL:         99,000         0         171         \$41,09         \$1,840.10           2 Control         \$0.00         \$0.00         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00         \$0.00           acr Closets         0         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           5         0         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           5         0         0         0	9,000 0 0 0 0 0 0 0 0 0 0 0 0	9,000 0 0 0 0 0 0 0 0 0 0 0 0	1				0	\$0.00	\$0.00	\$0.00
TOTAL:         99,000         0         \$0.00         \$0.00           Sc. Sinks         0         0         \$0.00         \$0.00           Sc. Sinks         0         0         \$0.00         \$0.00           Sc. Sinks         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           3         188,340         0         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00           Very Heads         0         \$0.00         \$0.00         \$0.00           F         0         \$0.00         \$0.00         \$0.00           F         0         \$0.00         \$0.00         \$0.00           Water         Heads         0         \$0.00         \$0.00           6         EST ANNUAL         0         \$0.00         \$0.00           6         CONSUMPTION         7.70 <t< td=""><td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Lavatory Sinks</td><td>000'66</td><td></td><td></td><td>171</td><td>\$41.09</td><td>\$1,840.10</td><td>\$9.70</td></t<>	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lavatory Sinks	000'66			171	\$41.09	\$1,840.10	\$9.70
TOTAL:         99,000         0         171         \$41.09         \$1,840.10           2         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           Sc. Sinks         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           3         188,340         0         \$0.00         \$0.00           3 cr Closets         0         0         \$0.00         \$0.00           3         188,340         0         \$0.00         \$0.00           Scr Closets         0         \$0.00         \$0.00           Scr Closets         0         \$0.00         \$0.00           Urinals         0         \$0.00         \$0.00           Uninals         0         \$0.00         \$0.00           Scr Closets         \$0.00         \$0.	9,000 0 0 0 0 0 0 0 38,340 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	9,000 0 0 0 0 0 0 0 88,340 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0			0	\$0.00	\$0.00	\$0.00
s         0         \$0.00         \$0.00           s         0         \$0.00         \$0.00           to         0         \$0.00         \$0.00           ts         \$0.00         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           EST ANNUAL         0.76         \$0.00         \$0.00           HOT WIR         0.76         \$0.00         \$0.00           CONSUMPTION         7.70         \$0.00         \$0.00           43,946         0         0         \$0.00         \$0.00           43,946         0         0         \$0.00         \$0.00           80.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		000'66	0	0	171	\$41.09	\$1,840.10	\$9.70
s         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           188,340         0         \$0.00         \$0.00           ts         \$0.00         \$0.00         \$0.00           th	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2	0			0	\$0.00	\$0.00	\$0.00
ts 0 0 0 0 \$0.00 \$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
ts         0         0         \$0.00         \$0.00           ts         0         \$0.00         \$0.00         \$0.00           ts         0         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00         \$0.00           ds         \$0.00         \$0.00         \$0.00         \$0.00           ESTANNUAL         \$0.00         \$0.00         \$0.00         \$0.00           CONSUMPTION         7.70         \$0.00         \$0.00           43,946         0         8.0.00         \$88.98           43,946         0         \$0.00         \$88.98	0 0 0 0 0 0 88,340 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0			0	\$0.00	\$0.00	\$0.00
ts         \$78.16         \$78.16           ts         0         \$0.00         \$0.00           to         \$0.00         \$0.00         \$0.00           188,340         \$78.16         \$78.16         \$78.16           0         \$0.00         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00         \$0.00           ds         \$0         \$0.00         \$0.00         \$0.00           EST ANNUAL         \$0.00         \$0.00         \$0.00         \$0.00           HOT WIR         \$0.76         \$0.00         \$0.00         \$0.00           (LITERS)         \$0.00         \$0.00         \$0.00         \$0.00           43,946         0         \$0.00         \$0.00         \$0.00         \$0.00           43,946         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00	38,340 0 0 88,340 0 0 0 0 0 0 0 0 0 0 0 XNNUAL XUMPTION ITERS) 3,946 0 0 0 3,946	38,340 0 0 88,340 0 0 0 0 0 0 0 0 0 0 0 XIMPTION ITERS) 3,946 3,946	ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
ts         0         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           ds         \$0         \$0.00         \$0.00           EST ANNUAL         \$0.00         \$0.00         \$0.00           HOT WTR         \$0.76         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96           (LITERS)         \$0.00         \$80.00         \$80.96           43,946         0         8         \$0.00         \$888.98	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3	188,340				\$78.16	\$78.16	\$838.80
0         \$0.00         \$0.00           188,340         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           4         \$0.00         \$0.00           43,946         \$0         \$0.00           4         \$0         \$0.00           43,946         \$0         \$0.00           43,946         \$0         \$0.00           43,946         \$0         \$0.00           43,946         \$0         \$0.00	0 0 0 0 0 0 0 0 0 0 0 ANNUAL 5T WTR SUMPTION TERS) 3,946 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Water Closets	0				\$0.00	\$0.00	\$0.00
188,340         \$78.16         \$78.16           0         0         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           ds         0         0         \$0.00         \$0.00           est annual         0         \$0.00         \$0.00         \$0.00           EST ANNUAL         0.76         \$0.00         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96         \$0.96           (LITERS)         43,946         0         8 \$0.00         \$88.98	18,340 0 0 0 0 0 0 0 0 0 0 0 Xinderical Sign of the control of the	18,340 0 0 0 0 0 0 0 0 0 0 0 0 0 XNNUAL OT WTR SUMPTION ITERS) 3,946 0 0 0		0				\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.	0 0 0 0 0 0 0 0 ANNUAL 5T WTR SUMPTION ITERS) 3,946 3,946	0 0 0 0 0 0 0 ANNUAL 5T WTR SUMPTION 17ERS) 3,946 3,946 0 0	ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$838.80
0         \$0.00         \$0.00           0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WTR         0.76         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96           (LITERS)         7.70         \$80.96           43,946         0         8         \$0.00	0 0 0 0 0 0 ANNUAL TWTR SUMPTION TERS) 3,946 3,946 0 0	0 0 0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	4	0				\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           ds         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           EST ANNUAL         0.76         \$0.00         \$0.00         \$0.00           HOT WTR         0.76         \$0.00         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96         \$0.00           43,946         0         8         \$0.00         \$88.98	0 0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	0 0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	Urinals	0				\$0.00	\$0.00	\$0.00
ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           EST ANNUAL         0         0         \$0.00           HOT WTR         0.76         \$80.00           CONSUMPTION         7.70         \$80.96           43,946         0         8         \$80.98	0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 3,946	0 0 0 0 0 ANNUAL 5T WTR SUMPTION ITERS) 3,946 3,946 0 0		0				\$0.00	\$0.00	\$0.00
ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WTR         0.76         \$80.0           CONSUMPTION         7.70         \$80.96           (LITERS)         7.70         \$80.96           43,946         0         8         \$0.00         \$88.98	0 0 0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 3,946	0 0 0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
ds         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           est Annual         0         \$0.00         \$0.00           HOT WTR         0.76         \$80.2           CONSUMPTION         7.70         \$80.96           (LITERS)         7.70         \$80.96           43,946         0         8         \$88.98	0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 3,946 0 0	2	0			0	\$0.00	\$0.00	\$0.00
0         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           EST ANNUAL         0.76         \$8.02           HOT WTR         7.70         \$80.96           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         8         \$88.98	0 0 0 ANNUAL SUMPTION ITERS) 3,946 0 0	0 0 0 ANNUAL 5T WTR SUMPTION TERS) 3,946 0 0	Shower Heads	0			0	\$0.00	\$0.00	\$0.00
0         0         0         \$0.00         \$0.00           EST ANNUAL         0.76         \$8.02           HOT WTR         7.70         \$80.96           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         8           43,946         0         8         \$88.98	0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0		0			0	\$0.00	\$0.00	\$0.00
EST ANNUAL       0.76       \$8.02         HOT WTR       7.70       \$80.96         CONSUMPTION       7.70       \$80.96         (LITERS)       43,946       8       \$88.98	ANNUAL  T WTR  SUMPTION  ITERS)  3,946  0 0	ANNUAL  OT WTR  SUMPTION  ITERS)  3,946  3,946	ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
HOT WTR         0.76         \$8.02           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         8         \$0.00         \$88.98	3,946 0 0	3,946 0 0	9	EST ANNUAL						
CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         8         \$88.98	3,946 0 0	3,946 0 0	Water	HOT WTR			0.76		\$8.02	\$16.80
(LITERS) 43,946 0 0 8 \$0.00 \$88.98	3,946 3,946 0 0	3,946 3,946 0 0	Heater	CONSUMPTION			7.70		\$80.96	\$60.00
43,946 0 0 8 \$0.00 \$88.98	3,946 0 0	3,946 0 0 3,946 0	(GAS)	(LITERS)						
43,946 0 0 8 \$0.00 \$88.98	3,946 0 0	3,946 0 0		43,946						
			ECO6 TOTAL:	43,946	0	0	8	\$0.00	\$88.98	\$76.80

Systems Engineering and Management Corporation, Knoxville, TN

		FY94S EEAP FT	T. KNC	. KNOX WAT CONSERVATION STUDY	S NOI	TUDY		16
FACILITY NO. : 9053 B		CAL	CULAT	ION WORK SHEET 1			DATE:	5 OCT 94
CCCUPANCY: FAMILY   Operating Hours: 724 UNIVALED STATE OF CONTROL OF 321 UNIVALED STATES OF CONTROL OF 321 UNIVAL OF 322 UNIVAL OF 323 UNIV	FACILITY NO.:	9053 B		FUNCTION:	,.	UNACCON	A PERS	DET
ECO Number         Existing Fixture System         Retrofited Fixture System         Usage Fixtures Country           ECO Type         Description         1.PM         HRS/YR Quantity           Lavatory Sinks         ECOT TOTAL:         LPM         LPM         2           ECOT TOTAL:         KITCHEN SINK         9.5 NO RETROFIT         9.5 365         1           Misc. Sinks         KITCHEN SINK         9.5 NO RETROFIT         9.5 365         1           Misc. Sinks         LPM         LPF         #FLVR         1           Misc. Sinks         A         19 1.6 GPF TANK TYPE TOILET         6.1 7300         2           Water Closets         LPM         LPF         HFLVR         2           ECO3 TOTAL:         LPM         LPF         HFLVR         2           ECO4 TOTAL:         LPM         LPF         HFLVR         2           ECO4 TOTAL:         LPM         LPM         HRS/YR         0           ECO5 TOTAL:         LPM         HRS/YR         0         0           ECO5 TOTAL:         LPM         HRS/YR         0         0           ECO5 TOTAL:         LPM         HRS/YR         0         0           ECO5 TOTAL:         RECOVERY: ?         3	Occupancy:	FAMILY		Operating Hours:	'	1 YPICAL 0	JF 327 U	χ Σ
ECO Type         Description         LPM         Description         LPM         HRS/PR Quantity           Lavatory Sinks         ECO1 TOTAL:         LPM         LPM         LPM         125         2           ECO1 TOTAL:         LPM         LPM         LPM         12         2           Misc. Sinks         KITCHEN SINK         9.5         NO RETROFIT         1PM         12           Misc. Sinks         LPM         LPF         LPF         #FLVR         1           ECO2 TOTAL:         LPF         LPF         #FLVR         1           Water Closets         LDF         LPF         HELVR         2           Urinals         LOURLIAL TYPE         9.5         NO RETROFIT         LPF         HELVR         1           ECO5 TOTAL:         LPM         HRS/YR         0         2         1           Shower Heads         ECO5 TOTAL:         LPM         HRS/YR         0         1           ECO5 TOTAL:         TEMP         Heater         RECOVERY: ?         3.45         1           ECO5 TOTAL:         RECOVERY: ?         INSTALL INSUL JACKET         322         8760         1           ECO5 TOTAL:         RECOVERY: ?         INSTALL INSUL JACKET	ECO Number	Existing Fixture System		Retrofited Fixture Syster		Usage	Fixtures	Water Leaks
Lavatory Sinks   SINK W/ AERATOR   9.5   NO RETROFIT   9.5   125   2	ECO Type	Description		Description	LPM	HRS/YR	Quantity	Eliminated LPY
Lavatory Sinks	-	SINK W/ AERATOR		NO RETROFIT	9.5	125	2	
LPM   LPM   2   1   1   1   1   1   1   1   1   1	Lavatory Sinks							
Misc. Sinks   LPF	ECO1 TOTAL:		LPM		LPM		2	0
ECO2 TOTAL:   3	2	KITCHEN SINK	$\vdash$	NO RETROFIT	9.5	365	-	0
ECO2 TOTAL:	Misc. Sinks							
3   TANK TYPE   19   1.6 GPF TANK TYPE TOILET   6.1   7300   2	ECO2 TOTAL:		LPF		LPF	#FL/YR	1	0
Water Closets	8	TANK TYPE	T	1 6 GPF TANK TYPF TOILET	6.1	7300	0	
CCO3 TOTAL:	Water Closets				5		1	
COO TOTAL:					1			
Urinals	ECO3 IOIAL:		1 1	esta de la companya d	LPF	#FL/YR	2	0
Urinals	4							
ECO4 TOTAL:         LPM         LPM         HRS/YR         0           5         RESIDENTIAL TYPE         9.5         NO RETROFIT         9.5         245         1           Shower Heads         TEMP         TEMP         1         1           ECO5 TOTAL:         GA GAL RUUD #P40-7         345 REDUCE STORAGE TEMP         322 8760         1           Water         CAPACITY: ?         1         1           Heater         RECOVERY: ?         INSTALL INSUL JACKET         322 8760         1           (GAS)         INSTALL INSUL JACKET         322 8760         1           ECO6 TOTAL:         Systems Engineering and Management Corporation, Knoxville, T	Urinals			The state of the s				
Shower Heads   TEMP   TEMP	ECO4 TOTAL		200			0,000	c	•
Shower Heads         ECO5 TOTAL:         PAGAL RUUD #P40-7         TEMP         TEMP         1           ECO5 TOTAL:         40 GAL RUUD #P40-7         345 REDUCE STORAGE TEMP 322 8760 1         1           Heater CAPACITY: ?         1 INSTALL INSUL JACKET 322 8760 1         1           ECO6 TOTAL:         ECO6 TOTAL:         1           SYSTEMS CORP         Systems Engineering and Management Corporation, Knoxville, T	ECO4 IOIAL:		_		- - -	חולאח	0	0
SYSTEMS CORP   TEMP	Showing Honds			40 RETROFIT	9.5	245	_	55640
ECO5 TOTAL:         TEMP         TEMP         1           6         40 GAL RUUD #P40-7         345         REDUCE STORAGE TEMP         322         8760         1           Water         CAPACITY: ?         345         REDUCE STORAGE TEMP         322         8760         1           (GAS)         ECO6 TOTAL:         INSTALL INSUL JACKET         322         8760         1           ECO6 TOTAL:         ECO6 TOTAL:         1         1           SYSTEMS CORP         Systems Engineering and Management Corporation, Knoxville, T	SHOWER HEADS			THE THE PROPERTY OF THE PROPER				
6     40 GAL RUUD #P40-7     345 REDUCE STORAGE TEMP     322 8760     1       Water     CAPACITY: ?     1NSTALL INSUL JACKET     322 8760     1       (GAS)     ECO6 TOTAL:     1     1       SYSTEMS CORP       Systems Engineering and Management Corporation, Knoxville, T	ECO5 TOTAL:		TEMP		TEMP		-	55640
Water     CAPACITY: ?     345 REDUCE STORAGE TEMP     322 8760     1       Heater     RECOVERY: ?     INSTALL INSUL JACKET     322 8760     1       (GAS)     ECO6 TOTAL:     1       Asstems Engineering and Management Corporation, Knoxville, TN	9	40 GAL RUUD #P40-7						
Heater RECOVERY: ? INSTALL INSUL JACKET 322 8760 1  (GAS)  ECO6 TOTAL:  Systems Engineering and Management Corporation, Knoxville, TN	Water	CAPACITY: ?		REDUCE STORAGE TEMP	322	8760	-	
ECO6 TOTAL:  Systems Engineering and Management Corporation, Knoxville, TN	Heater	1 1		NSTALL INSUL JACKET	322	8760	-	
ECO6 TOTAL:  Systems Engineering and Management Corporation, Knoxville, TN	(GAS)							
SYSTEMS CORP Systems Engineering and Management Corporation, Knoxville, TN	1000							
SYSTEMS CORP Systems Engineering and Management Corporation,	ECO6 TOTAL:						-	0
SYSTEMS CORP Systems Engineering and Management Corporation,								
SYSTEMS CORP Systems Engineering and Management Corporation,								
		CORP	Systen	ns Engineering and Manager	nent Co	orporation		ille, TN
448	34							
	48							

	<b>FY94S EEAP FT. KNOX</b>	T. KNO	X WAT	WATER CON	<b>RVATION STUDY</b>	TUDY	2 OF 2
		CAL	\LCULA1	TION WOI			
FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
ECO Number	Annual Water	Annual	Energy	Saving	WATER	Total	Total
ECO Type	Saving LPY	ELEC	ELEC	GAS MWH	Dollar Saving	Dollar Saving	Dollars Invested
-				0	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
3	188,340				\$78.16	\$78.16	\$838.80
Water Closets	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$838.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
2	55,640			96	\$23.09	\$1,034.18	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	55,640	0	0	96	\$23.09	\$1,034.18	\$0.00
9	EST ANNUAL						
Water	HOT WTR			1.75		\$18.35	
Heater	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS)						
	43,946						
ECO6 TOTAL:	43,946	0	0	6	\$0.00	\$99.31	\$60.00
CVCTEMS COPD	990			,			THE CHILDREN TO SERVICE STATES OF THE CHILD SERVICE STATES

**SYSTEMS CORP** 

	FY94S EEAP FT	r. KNC	. KNOX WAT	S NOI	TUDY		10
	CALC	CULAT				DATE:	5 OCT 94
FACILITY NO.:	9141 A&B		FUNCTION:		UNACCON	UNACCOM PERS HOU	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:	·	24	5	)
ECO Number	Existing Fixture System		Retrofited Fixture System		Usage		Water Leaks
ECO Type	Description	LPM	Description	LPM	HRS/YR	Quantity	Eliminated LPY
•	SINK W/ AERATOR		NO RETROFIT	9.5	125	1	
Lavatory Sinks	SINK W/O AERATOR	22.7	INSTALL AERATOR	9.5	125	-	
FCO1 TOTAL .		Md		Md		2	C
2	KITCHEN SINK	_	NO RETROFIT	9.5	365	1	0
Misc. Sinks							
ECO2 TOTAL:		LPF		LPF	#FL/YR		0
2	TANK TVDE	10	1 B CDE TANK TVDE TOHET	ρ 1	14600		
Water Closets		2		- -	14000	-	
ECO3 TOTAL:		LPF		1 PF	#FL/YR	-	0
4							
Urinals							
ECO4 TOTAL:		LPM		I.PM	HRS/YR	0	0
5	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.5	245	-	0
Shower Heads							
ECO5 TOTAL:		TEMP		TEMP		-	0
9	40 GAL RHEEM/FURY						
Water	CAPACITY: ?	328	REDUCE STORAGE TEMP	322	8760	-	
Heater	RECOVERY: ?		INSTALL INSUL JACKET	322	8760	1	
(GAS)							
ECO6 TOTAL:		17				1	0

SYSTEMS CORP

CALCULATION WOR   CALCULATION   CALCULATIO		FY94S EEAP FT. KNOX	FT. KNC		WATER CON	RVATION STUDY	TUDY	2 OF 2
Mater Rate:			S		TION WOR	RK SHEET 2		
tate:         10.51         \$/MWH         Demand Rate:           Lal Water         Annual Energy Saving         WATER           ng LPY         KW         KWH         MWH         Dollar Saving           0         0         \$0.00           9,000         0         \$0.00           9,000         0         \$0.00           9,000         0         \$0.00           0         0         \$0.00           0         0         \$0.00           0         0         \$0.00           0         0         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0<	FACILITY NO. :	Water Rate:	0.42			Energy Rate:		\$/KWH
nal Water         Annual Energy Saving         WATER           ng LPY         KWH         MWH         Dollar Saving           0         0         0         \$0.00           9,000         0         0         \$0.00           9,000         0         0         \$0.00           0         0         0         \$0.00           0         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           0         0         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00      <	9141 A&B	Gas Rate:	10.51	#WW/\$		Demand Rate:		\$/KW
ng         LPY         ELEC         ELEC         GAS         Dollar Saving         I           0         0         \$0.00         \$0.00         \$0.00           9,000         0         2         \$0.41         \$0.00           0         0         0         \$0.00         \$0.00           0         0         0         \$0.00         \$0.00           0         0         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00           0         0         \$0.00         \$0.00         \$0.00	ECO Number	Annual Water	Annua	Energy	Saving	WATER	Total	Total
0         0         \$0.00           9,000         0         \$0.41           0         0         \$0.00           0         0         \$0.00           0         0         \$0.00           0         0         \$0.00           0         0         \$0.00           0         0         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00	ECO Type		ELEC	ELEC	GAS	Dollar Saving	Dollar Saving	Dollars Invested
9,000 2 \$0.41 0 0 0 2 \$0.00 0 0 0 \$0.00 0 0 0 \$0.00 0 0 0 \$0.00 0 0 0 \$0.00 0 0 \$0.00 0 0 \$0.00 0 0 \$0.00	1				0	\$0.00	\$0.00	\$0.00
0         0         \$0.00           9,000         0         \$0.00           0         0         \$0.00           0         0         \$0.00           0         0         \$0.00           0         0         \$0.00           0         0         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           NTWR         \$0.00         \$0.00           3,946         \$0.00         \$0.00	Lavatory Sinks	000'66			2	\$0.41	\$18.40	\$9.70
9,000         0         2         \$0.41           0         0         \$0.00           0         0         \$0.00           0         0         \$0.00           0         0         \$0.00           38,340         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00 <td< td=""><td></td><td>0</td><td></td><td></td><td>0</td><td>\$0.00</td><td>\$0.00</td><td>\$0.00</td></td<>		0			0	\$0.00	\$0.00	\$0.00
0 \$0.00 0 0 \$0.00 0 0 \$0.00 0 0 \$0.00 0 0 \$0.0	ECO1 TOTAL:	99,000	0	0	2	\$0.41	\$18.40	\$9.70
0 \$0.00 0 \$0.00 1.770 1.770 1.770 2.946 0 \$0.00 0 \$0.00 2.900 0 \$0.00 0 \$0.00 0 \$0.00 2.900 0 \$0.00 0 \$0.00 2.900 0 \$0.00 0 \$0.00 2.900 0 \$0.00 0 \$0.00 2.900 0 \$0.00 0 \$0.00 2.900 0 \$0.00 0 \$0.00 2.900 0 \$0.00 0 \$0.00 2.900 0 \$0.00 0 \$0.00 0 \$0.00 2.900 0 \$0.00 0 \$0.00 2.900 0 \$0.00 0 \$0.00 2.900 0 \$0.00 0 \$0.00 0 \$0.00 2.900 0 \$0.00 0 \$0.00 2.900 0 \$0.00 0 \$0.00 0 \$0.00 2.900 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 2.900 0 \$0.00 0 \$0.00	2	0			0	\$0.00	\$0.00	\$0.00
0 0 \$0.00 18,340 0 0 0 \$0.00 0 \$0.00 1,70 1,70 1,70 1,70 1,3946 0 0 8 \$0.00	Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
0         0         \$0.00           38,340         \$78.16           0         \$0.00           0         \$0.00           0         \$0.00           0         \$0.00           0         \$0.00           0         \$0.00           0         \$0.00           0         \$0.00           0         \$0.00           0         \$0.00           0         \$0.00           0         \$0.00           SUMPTION         7.70           ITERS)         7.70           3,946         0           3,946         0           3,946         0		0			0	\$0.00	\$0.00	\$0.00
38,340       \$78.16         0       \$0.00         0       \$0.00         0       \$0.00         38,340       \$0.00         0       \$0.00         0       \$0.00         0       \$0.00         0       \$0.00         0       \$0.00         0       \$0.00         0       \$0.00         O       \$0.00         NT WTR       \$0.46         SUMPTION       7.70         ITERS)       \$3,946         3,946       0         3,946       0	ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
0 \$0.00 83.340 \$0.00 83.340 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.46 0 \$0.00 0 \$0.46 0 \$0.46 0 \$0.46 0 \$0.46 0 \$0.46 0 \$0.46 0 \$0.46 0 \$0.40 0 \$0	3	188,340				\$78.16	\$78.16	\$418.80
0 38,340 \$5.000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Water Closets	0				\$0.00	\$0.00	\$0.00
38,340       \$78.16         0       \$0.00         0       \$0.00         0       \$0.00         0       \$0.00         0       \$0.00         0       \$0.00         0       \$0.00         0       \$0.00         0       \$0.00         OT WIR       0.46         SUMPTION       7.70         ITERS)       7.70         3,946       0         3,946       0		0				\$0.00	\$0.00	\$0.00
0 \$0.00 0 \$0.00 0 \$0.00 0 \$0.00 0 0 \$0.00 0 0 \$0.00 0 0 \$0.00 0 0 \$0.00 1T WTR 0.46 \$0.00 ITERS) 7.70 3,946 0 0 8 \$0.00	ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$418.80
0 \$0.00 0 \$0.00 0 \$0.00 0 0 \$0.00 0 0 \$0.00 0 0 \$0.00 ANNUAL 0 46 SUMPTION 7.70 ITERS) 7.70 3,946 0 0 8 \$0.00	4	0				\$0.00	\$0.00	\$0.00
0 \$0.00 0 \$0.00 0 0 \$0.00 0 0 \$0.00 0 0 \$0.00 ANNUAL 0.46 SUMPTION 7.70 ITERS) 7.70 3,946 0 0 8 \$0.00	Urinals	0				\$0.00	\$0.00	\$0.00
0         \$0.00           0         \$0.00           0         \$0.00           0         \$0.00           0         \$0.00           ANNUAL         0.46           SUMPTION         7.70           ITERS)         7.70           3,946         0           3,946         0		0				\$0.00	\$0.00	\$0.00
0 \$0.00 0 0 \$0.00 0 0 \$0.00 ANNUAL 0.46 SUMPTION 7.70 ITERS) 7.70 3,946 0 0 8 \$0.00	ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
0 \$0.00 0 0 \$0.00 0 0 \$0.00 ANNUAL DT WTR 0.46 SUMPTION 7.70 ITERS) 7.70 3,946 0 0 8 \$0.00	2	0			0	\$0.00	\$0.00	\$0.00
0         0         \$0.00           0         0         \$0.00           ANNUAL         0.46           SUMPTION         7.70           ITERS)         7.70           3,946         0         8         \$0.00	Shower Heads	0			0	\$0.00	\$0.00	\$0.00
0         0         0         \$0.00           ANNUAL         0.46         0.46           SUMPTION         7.70         1.70           ITERS)         3,946         0         8         \$0.00		0			0	\$0.00	\$0.00	\$0.00
ANNUAL OT WTR OT WITH	ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
OT WTR       0.46         SUMPTION       7.70         ITERS)       3,946         3,946       0       8       \$0.00	9	EST ANNUAL				,		
SUMPTION 7.70	Water	HOT WTR			0.46		\$4.88	\$16.80
3,946 0 0 8 \$0.00	Heater	CONSUMPTION			7.70		\$80.96	\$60.00
3,946 3,946 0 0 8 \$0.00	(GAS)	(LITERS)						
3,946 0 0 8 \$0.00		43,946						
	ECO6 TOTAL:	43,946	0	0	8	\$0.00	\$85.84	\$76.80
SYSTEMS CORP Systems Engineering and Management Corporation,	SYSTEMS C	ORP			Systems	Engineering and	Management Cor	poration, Knoxville, TN

Systems Engineering and Management Corporation, Knoxville, TN

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### 4 ECIP PROJECT 2

T 2
FY94S WATER CONSERVATION STUDY (WATER AND ENERGY), FT. KNOX, KY

This section contains the project description and the DD1391 forms for ECIP Project FH-2, Family Housing Water Conservation Phase II improvements to 1,602 Family Housing Units. Two lists of the buildings included in the project follow the DD1391 forms. The first list includes all buildings considered in the project in numerical order. The second list shows which buildings were used to model unsurveyed buildings. Following these lists are the LCCID report and the cost estimate for the proposed project. Calculation sheets for the individual buildings follow the project cost estimate. Below is a detailed index of the information included in this section.

DD1391 Form	-2
Table 4.1 - ECIP FH-2 - Family Housing	-6
able 4.2 - Buildings Modeled by Surveyed Buildings	-7
Project LCCID Report	-8
Catalog Cut Sheets/Product Information	-9
Project Cost Estimate	10
Building Calculation Sheets	13

DATE:

22 December 1994

PROJECT NO.:

ECIP-FH2

PROJECT TITLE:

Family Housing Water Conservation Phase II

INSTALLATION:

Fort Knox

LOCATION:

Kentucky

### PRIMARY FACILITY

Water Closets

\$993,000

ESTIMATED CONTRACT COST	\$820,000
CONTINGENCY PERCENT (10%)	82,000
SUBTOTAL	902,000
SUPERVISION, INSPECTION & OVERHEAD (5%)	45,100
DESIGN COST	45,100
TOTAL REQUEST	992,200
TOTAL REQUEST (ROUNDED)	\$993,000

Replace water closets in 1602 family housing units with water saving, 6 liters (1.6 gallons) per flush water closets. All water closets will be of the flush tank type. The project will significantly reduce potable water consumption and sanitary waste production.

DATE:

22 December 1994

PROJECT NO.:

ECIP-FH2

PROJECT TITLE:

Family Housing Water Conservation Phase II

INSTALLATION:

Fort Knox

LOCATION:

Kentucky

### PROIECT:

Replace water closets in 1602 family housing units with water saving, 6 liters (1.6 gallons) per flush water closets.

### **REQUIREMENTS:**

Fort Knox utilizes inefficient outdated water closets in its family housing units. The existing water closets consume significantly more water and generate greater quantities of sanitary waste per flush than the new standard water saving water closet. The existing inefficient systems place greater demand on the water table, water treatment plant and waste treatment plant. The U.S. Army Corp of Engineers, Louisville District, contracted an Energy Engineering Analysis Program (EEAP) Water Conservation Study of the Post. The study identified energy and water conservation opportunities. Life cycle cost analysis was performed on each opportunity to determine its discounted savings-to-investment ratio (SIR) and estimated payback period. This project has a SIR of 2.61 and a simple payback period of 5.68 years. The project exceeds the minimum requirements of an SIR greater than 1.25 and a simple payback of less than 10 years.

### **CURRENT SITUATION:**

The family housing units at Ft. Knox have inefficient water closets. The family housing units consume more water and generate more sanitary waste than is necessary. The new water closets will greatly reduce the water consumption and waste generated.

### IMPACT IF NOT PROVIDED:

If this project is not implemented, 1602 family housing units will continue to consume more water and generate more waste than necessary. The U.S. Army will fail to realize an estimated \$175K in annual savings (FY95\$) and a total discounted savings of \$2.59M during the twenty year life of the project.

### ADDITIONAL:

A life cycle cost analysis was performed on the project. The project will realize water savings of over 2.6 times the initial investment cost and will pay for itself in less than 5.7 years.

Ft. Knox is not on the list of installations considered for closure or realignment.

DATE:

22 December 1994

PROJECT NO .:

ECIP-FH2

PROJECT TITLE:

Family Housing Water Conservation Phase II

INSTALLATION:

Fort Knox

LOCATION:

Kentucky

SECTION 11 - ECONOMIC ANALYSIS DATA

11D ECONOMIC JUSTIFICATION SUMMARY

This water conservation project is recommended for funding. A life cycle cost analysis was performed on each portion of this project and on the overall project. The overall project will realize water savings of over 2.6 times the initial investment cost and will pay for itself in less than 5.7 years.

TABLE 4.1 ECIP FH-2 - FAMILY HOUSING

	: 4510 A II	: 4000 A D	5300 A-H - 5370 A-H
4402 A-D	4518 A-H	4888 A-D	
4404 A-L	4521 A-E	4889 A-F	5310 A-H
4408 A-D	4801 A-D	4891 A-F	5311 A-H
4410 A-C, E-F	4802 A-F	4894 A-F	5314 A-C, E-H
4413 A-D	4804 A-C	4897 A-D	5315 A-H - 5317 A-H
4414 A-F	4806 A-D	4898 A-D	5320 A-H - 5330 A-H
4417 A-D	4807 A-D	4899 A-F	5334 A-H
4418 A-L	4808 A-F	4902 A-D	5336 A-H
4422 A-D	4810 A-F	4903 A-D	5337 A-H
4423 A-L	4811 A-D	4904 A-F	5339 A-H
4427 A-L	4813 A-D	4907 A-D	5340 A-H
4431 A-F	4814 A-D	4908 A-L	5342 A-H
4434 A-F	4816 A-D	4913 A-D	5344 A-H
4437 A-F	4818 A-D	4914 A-H	5346 A-H - 5349 A-H
4439 A-L	4820 A-D	4916 A-F	5351 A-H - 5353 A-E
4443 A-D	4822 A-D	4917 A-D	5353
4444 A-D	4822 A-D	4918 A, C-L	5353 G-H - 5358 A-H
4446 A-L	4823 A-D	4921 A-L	5364 A-H - 5368 A-H
4450 A-C, E-L	4824 A-H	4925 A-D	5370 A-H
4454 A-D	4827 A-F	4926 A-L	5400 A-H
4455 A-D	4829 A-L	4930 A-D	5406 A-D
4456	4833 A-L	4931 A-F	5406 F-H - 5409 A-H
4456 A-L	4837 A-D	4934 A-E	5411 A-H - 5413 A-H
4460 A-L	4838 A-L	4936 A-L	5415 A-H
4464 A-D	4842 A, C-F	4940 A-F	5417 A-H
4465 A-D	4844 A-L	4942 A-L	5419 A-H - 5422 A-H
4466 A-E	4848 A-F	4946 A-D	5425 A-H
4468 A-D	4850 A-L	4947 A-F	5427 A-H
4469 A-D	4854 A-D	4950 A-D	5430 A-H
4471 A-D - 4473 A-D	4855 A-D	4951 A-L	5432 A-H - 5436 A-H
4474 A-D	4856 A-F	4955 A-D	5438 A-H
4476 A-L	4859	4957 A-L	5441 A-H
4480 A-L	4859 B-D - 4861 A-D	4963 A-L	5442 A-H
4484 A-E	4862 A-F	4967 A-F	5444 A-H
4486 A-D	4865 A-H	4969 A-K	5446 A-H
4488 A-L	4868 A-F	4973 A-D	5447 A-H
4492 A-L	4870	4974 A-F	5449 A-H
4496	4870 A-L	49*76 A-D	5450 A-H
4496 B-D - 4498 A-D	4874 A-D	4977 A-F	5452 A-H
4499 A-L	4875 A-K	4979 A-F	5454 A-H
4503 A, C-D	4879 A-D	4981 A-F	5455 A-H
4504 A-L	4880 A-F	4984 A-D	5457 A-H - 5459 A-H
4508 A-L	4883 A-D	4985 A-DE	5461 A-H
4512 A-H	4884 A-F	4987 A-F	
4515 A-F	4887 A-D		
.515 /11			1

TABLE 4.2 BUILDINGS MODELED BY SURVEYED BUILDINGS

BUILDINGS SURVEYED AND CALCULATED	BUILDINGS ASSUMED TYPICAL OF SURVEYED BUILDINGS
5353	5300A-H - 5307A-H, 5310A-H, 5311A-H, 5314A-C & E-H, 5315A-H - 5317A-H, 5320A-H - 5330A-H, 5334A-H, 5336A-H, 5337A-H, 539A-H, 5340A-H, 5342A-H, 5344A-H, 5346A-H - 5349A-H, 5351A-H - 5353A-E, 5353G-H - 5358A-H, 5364A-H - 5368A-H, 5370A-H, 5400A-H - 5406A-D, 5406F-H - 5409A-H, 5411A-H - 5413A-H, 5415A-H, 5417A-H, 5419A-H - 5422A-H, 5425A-H, 5427A-H, 5430A-H, 5432A-H, 5446A-H, 5447A-H, 5449A-H, 5450A-H, 5452A-H, 5454A-H, 5455A-H, 5457A-H - 5459A-H, 5461A-H
4456	4402A-D, 4404A-L, 4408A-D, 4410A-C & E-F, 4414A-F, 4418A-L, 4423A-L, 4427A-F, 4431A-F, 4434A-F, 4437A-F, 4439A-L, 4444A-D,4446A-L, 4450A-C & E-L, 4456A-L, 4460A-L, 44666A-E, 4469A-D, 4474A-D, 4476A-L, 4480A-L, 4484A-E, 4486A-D, 4488A-L, 4492A-L, 4499A-L, 4504A-L, 4508A-L, 4512A-H, 4515A-F, 4518A-H, 4521A-E
4496	4413A-D, 4417A-D, 4422A-D, 4443A-D, 4454A-D, 4455A-D, 4464A-D, 4465A-D, 4468A-D, 4471A-D - 4473A-D, 4496B-D - 4498A-D, 4503A & C-D
4859	4801A-D, 4806A-D, 4807A-D, 4811A-D, 4813A-D, 4822A-D, 4822A-D, 4823A-D, 4837A-D, 4854A-D, 4855A-D, 4859B-D - 4861A-D, 4879A-D, 4883A-D, 4887A-D, 4888A-D, 4897A-D, 4898A-D, 4902A-D, 4903A-D, 4907A-D, 4913A-D, 4917A-D, 4925A-D, 4930A-D, 4946A-D, 4950A-D, 4973A-D, 4976A-D, 4984A-D
4870	4802A-F, 4804A-C, 4808A-F, 4810A-F, 4814A-D, 4816A-D, 4818A-D, 4820A-D, 4824A-H, 4827A-F, 4829A-L, 4833A-L, 4838A-L, 4824A &C-F, 4844A-L, 4848A-F, 4850A-L, 4856A-F, 4826A-F, 4865A-H, 4868A-F, 4870A-L, 4874A-D, 4875A-K, 4880A-F, 4884A-F, 4889A-F, 4891A-F, 4894A-F, 4899A-F, 4904A-F, 4908A-L, 4914A-H, 4918A & C-L, 4921A-L, 4926A-L, 4931A-F, 4934A-E, 4936A-L, 4940A-F, 4942A-L, 4947A-F, 4951A-L, 4955A-D, 4957A-L, 4961A-F, 4963A-L, 4967A-F, 4969A-K, 4974A-F, 4977A-F, 4979A-F, 4981A-F, 4985A-D, 4987A-F

LIFE CYCLE COST ANALYSIS SUMMARY

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FT KNOX

REGION NOS. 4 CENSUS: 3 PROJECT NO. & TITLE: ECIP-FH2 FAMILY HOUSING PROJECT 2 FISCAL YEAR 1995 DISCRETE PORTION NAME: WATER ANALYSIS DATE: 12-27-94 ECONOMIC LIFE 20 YEARS PREPARED BY: DERRINGTON 1. INVESTMENT A. CONSTRUCTION COST \$
B. SIOH \$
C. DESIGN COST \$ 902000. 45100. C. DESIGN COST \$ 45100. D. TOTAL COST (1A+1B+1C) \$ 992200. E. SALVAGE VALUE OF EXISTING EQUIPMENT \$ F. PUBLIC UTILITY COMPANY REBATE 992200. G. TOTAL INVESTMENT (1D - 1E - 1F) 2. ENERGY SAVINGS (+) / COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994 UNIT COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNTED \$/MWH(1) MWH/YR(2) SAVINGS(3) FACTOR(4) SAVINGS(5) THUEL. A. ELECT \$ 46.40 B. DIST \$ .00 C. RESID \$ .00 D. NAT G \$ 10.51 15.08 0. ውውውውውውው የ 0. 0. 0. 18.57 0. 0. 0. 0. 0. 0. 21.02 0. 0. 18.58 0. 16.83 17.38 0. E. COAL \$ .00 Ο. 0. .00 0. F. PPG \$ 14.88 0. M. DEMAND SAVINGS 0. N. TOTAL 3. NON ENERGY SAVINGS (+) / COST(-) \$ 125000. A. ANNUAL RECURRING (+/-) (1) DISCOUNT FACTOR (TABLE A) 14.88 (2) DISCOUNTED SAVING/COST (3A X 3A1) 1860000. B. NON RECURRING SAVINGS (+) / COSTS (-) SAVINGS(+) YR DISCUT DISCOUNTED COST(-) OC FACTR SAVINGS(+)/ ITEM (1) (2) (3) \$ 992200. 10 .74 COST(-)(4)734228. 1. REPLACEMENT 734228. d. TOTAL \$ 992200. C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 2594228. 4. FIRST YEAR DOLLAR SAVINGS 2N3+3A+(3Bd1/(YRS ECONOMIC LIFE))\$ 174610. 5. SIMPLE PAYBACK PERIOD (1G/4) 5.68 YEARS \$ 2594228. 6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) 7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) =2.61 (IF < 1 PROJECT DOES NOT QUALIFY) \*\*\*\* Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR):

N/A



- · Water-saving 1.5 gallon flush.
- · Features Pressure-Clean™ flushometer tank system.
- Three-bolt quick connect system with factory-installed tank gasket and bolts.

K-3458 Wellworth Lite PC Toilet, vitreous china, 1.5 gallon flush. Closecoupled design with elongated bowl. Minimum roughing-in is 12" (305 mm).

Tank/bowl combination includes K-4333 bowl, K-4470 vitreous china tank with Kohler 81100 flushometer tank system. K-4471 tank cover and K-9434 chrome-plated trip lever.

IMPORTANT-For most satisfactory operation, a minimum static water pressure of 25 P.S.I. is required at the toilet supply inlet.

Recommended Seats and Supply K-4650 Lustra\* solid plastic seat with open front and cover. K-4652 Lustra solid plastic seat with closed front and cover.

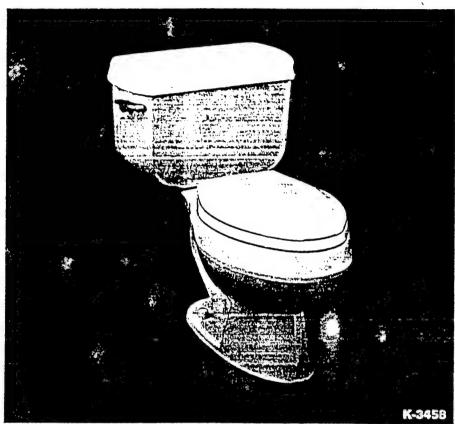
K-4670-C Lustra solid plastic seat (K-4681-C Black Black™) with open front and check hinge.

K-7637 %" angle supply with stop.

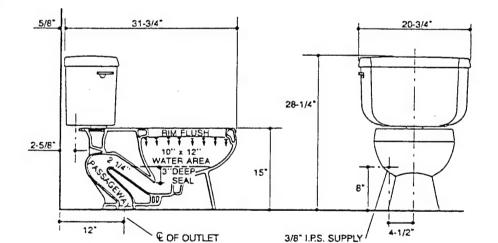
Tank Locks-Add suffix "-T" to product number.

Bedpan Lugs-Add suffix "-L" to product number.

For complete color selection, see Colors section.



Wellworth Lite PC Toilet and Lustra seat (K-4652) in White.



3/8" I.P.S. SUPPLY



Estimate: Description: Project: Location: Sq. footage:	LIMITED FORT KNO	WATER CLO EEAP (WTR) X, KY	OSETS - FA )Bid Date: Job #:	15-Dec-94 MILY HOUSING 94013.03 ::Louisville,		
Line #	Descript	 ion			======	========
		Matl	Labor	Equipment	Sub	Total
		=======	=======		======	=======
1521801100 Unit values Totals	FLOOR MN'	TD, 2PC WF 235.00	NEW WATER HITE W/SEA 114.30 \$245,979	SAVING WATER T, 1.6 GPF 0.00 \$0	2152.00	349.30
U15 MECHANICAL	8652	\$505,720	\$245,979	\$0	\$0	\$751,699

	=======		=======			========
Line #	Descript	ion				
	Manhours	Matl	Labor	Equipment	Sub	Total
				=======		=======
ESTIMATE TOTAL	8652	\$505,720	\$245,979	\$0	\$0	\$751,699
SALES TAX MATL MARKUP	0.00%	\$0 \$0	ĊO			
LABOR MARKUP EQUIPT MARKUP SUB MARKUP	0.00% 0.00% 0.00%		\$0	\$0	\$0	
CONTINGENCY	10.00%	\$505,720	\$245,979	\$0	\$0	\$751,699 \$75,170
BOND PROFIT	0.00% 10.00%					\$0 \$75,170
JOB TOTAL						\$902,039

\_\_\_\_\_\_\_

Estimate: ECO - 3 Date: 15-Dec-94
Description: INSTALL WATER CLOSETS - FAMILY HOUSING
Project: LIMITED EEAP (WTR)Bid Date:
Location: FORT KNOX, KY Job #: 94013.03
Sq. footage: FAM HSG - GP 2 City indx:Louisville, KY

SUMMARY

,		00111				
/ <del></del>	Manhours	Matl	Labor	Equipment	Sub	Total
	======					
U15 MECHANICAL	8652	\$505,720	\$245,979	\$0	\$0	\$751,699
TOTAL	8652	\$505,720	\$245,979	\$0	\$0	\$751,699
SALES TAX MATL MARKUP LABOR MARKUP EQUIPT MARKUP SUB MARKUP	0.00% 0.00% 0.00% 0.00% 0.00%	\$0 \$0	\$0	\$0	\$0	
TOTAL BEFORE CO CONTINGENCY BOND PROFIT	ONTINGENC 10.00% 0.00% 10.00%	\$505,720	\$245,979	\$0	\$0	\$751,699 \$75,170 \$0 \$75,170
JOB TOTAL						\$902,039

	FY94S EEAP FT	r. KN	. KNOX WA! R CONSERVATION STUDY	S NOI	TUDY		1 6 2
	CALC	ULAT	CALCULATION WORK SHEET 1			DATE:	5 OCT 94
FACILITY NO. :	4456 G		FUNCTION:		UNACCOM PERS		HOUS DET FAC
Occupancy:	FAMILY (2BR)		Operating Hours:		TYPICAL (	TYPICAL OF 278 UNITS	SLIN
ECO Number	Existing Fixture System		Retrofited Fixture System	E	Usage	Fixtures	Water Leaks
ECO Type	Description	LPM	Description	LPM	~	Quantity	Eliminated LPY
1	SINK W/ AERATOR	9.5	NO RETROFIT	9.2	125	1	
Lavatory Sinks							
ECO1 TOTAL:		LPM		LPM		1	0
2	KITCHEN SINK	9.5	NO RETROFIT	9.5	365	-	0
Misc. Sinks							
ECO2 TOTAL:		LPF		LPF	#FL/YR	-	0
3	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	14600	-	
Water Closets							
ECO3 TOTAL:		LPF		LPF	#FL/YR	1	0
4							
Urinals							
ECO4 TOTAL:		LPM		LPM	HRS/YR	0	0
2	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.5	245	1	0
Shower Heads							
ECO5 TOTAL:		TEMP		TEMP		-	0
9	30 GAL A. O. SMITH						
Water	CAPACITY: ?	334	REDUCE STORAGE TEMP	322	8760	-	
Heater	RECOVERY: ?		INSTALL INSUL JACKET	322	8760	-	
(GAS)		į					
ECO6 TOTAL:						1	0

### PAGE 4-13

	FY94S EEAP FT. KNOX	T. KNO		ER CON	WATER CON RVATION STUDY	TUDY	2 OF 2
		CAL		ION WO	CULATION WORK SHEET 2		
FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
ECO Number	Annual Water	Annual	Annual Energy	Saving	WATER	Total	Total
ECO Type	Saving LPY	ELEC KW	ELEC	GAS MWH	Dollar Saving	Dollar Saving	Dollars Invested
1	0			0	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
3	188,340				\$78.16	\$78.16	\$418.80
Water Closets	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$418.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
9	EST ANNUAL						
Water	HOT WTR			0.89		\$9.37	
Heater	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS)						
	43,946						
ECO6 TOTAL:	43,946	0	0	6	\$0.00	\$90.33	\$60.00

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	FY94S EEAP FT	T. KN	. KNOX WAY R CONSERVATION STUDY	S NOI	TUDY		102
	CAL	CULAT	CALCULATION WORK SHEET 1			DATE:	5 OCT 94
FACILITY NO.:	4496		FUNCTION:	— <sub>1</sub> .	UNACCOM PERS HOU	A PERS	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY (3BR)	Ŋ	Operating Hours:	,	24 24	25 TO	0
ECO Number	Existing Fixture System		Retrofited Fixture System	r.	Usage	Fixtures	Water Leaks
ECO Type	Description	LPM	Description	LPM	HRS/YR	Quantity	Eliminated LPY
1 System Sinks	SINK W/ AERATOR	9.5	NO RETROFIT	9.5	125	-	
Lavatory Silling							
ECO1 TOTAL:		LPM		LPM		-	0
2	KITCHEN SINK		NO RETROFIT	9.5	365	7	0
Misc. Sinks							
ECO2 TOTAL:		LPF	· · · · · · · · · · · · · · · · · · ·	LPF	#FLYR	F	0
3	TANK TYPE	-	1.6 GPF TANK TYPE TOILET	6.1	14600	1	
Water Closets							
14101 0001							
ECUS IOIAL:		7	では、一般のでは、大学のでは、大学のでは、大学のでは、大学のでは、大学のでは、大学のでは、大学のでは、大学のでは、大学のでは、大学のでは、大学のでは、大学のでは、大学のでは、大学のでは、大学のでは、大学の	LPF	#FL/YR	-	0
4							
Orinais							
FCOA TOTAL .		DW		MO	UDOND		
5	RESIDENTIAL TYPE	_	NO RETROFIT	0 5	245	> -	
Shower Heads	1 1			2	217	-	
ECO5 TOTAL:		TEMP		TEMP		-	0
9	30 GAL A. O. SMITH						
Water		334	REDUCE STORAGE TEMP	322	8760	_	
Heater	RECOVERY: ?		INSTALL INSUL JACKET	322	8760	-	
(GAS)							
ECO6 TOTAL:			一	34. 27.	機能はいれば	-	0

SYSTEMS CORP
PAGE 4-15

FACILITY NO. :	111-4 D-4-						1
4496	Water Kate:	0.42	\$/KL		Energy Rate:		\$/KWH
	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
ECO Number	Annual Water	Annual		Saving	WATER	Total	Total
ECO Type	Saving	ELEC	ELEC	GAS	Dollar Saving	Dollar Saving	Dollare Invected
1				0	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
3	188,340				\$78.16	\$78.16	\$418.80
Water Closets	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$418.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
5	0			0	\$0.00	\$0.00	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
9	EST ANNUAL						
Water	HOI WIK			0.89		\$9.37	
Heater	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS) 43 946						
ECOR TOTAL.	370 01		c	c	00 00	600.00	00 004
1000 101AF.	40,040	2	5	2	40.00	430.33	\$00.00

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	1 4 A L L C A C L C A C L C A C L C A C L C A C L C A C L C A C L C A C L C A C L C A C L C A C L C A C L C A C A				7. 41.12		4
	FY94S EEAP FI.	Z .	KNOX WANTER CONSERVATION STUDY	S	IUDY		
	CAL	CULA	CALCULATION WORK SHEET 1			DATE:	5 OCT 94
FACILITY NO.:	4859 A		FUNCTION:		UNACCO	M PERS	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:	,	24 24	24 24 24 24 24 24 24 24 24 24 24 24 24 2	0
ECO Number	Existing Fixture System		Retrofited Fixture System		Usage	Fixtures	Water Leaks
ECO Type	Description	LPM	Description	LPM	HRS/YR	Quantity	Eliminated LPY
-	SINK W/ AERATOR	9.5	NO RETROFIT	9.5	125	1	
Lavatory Sinks							
ECO1 TOTAL:		LPM		LPM		-	0
2	KITCHEN SINK	9.5	NO RETROFIT	9.5	365	က	0
Misc. Sinks							
ECO2 TOTAL:		LPF		LPF	#FL/YR	3	0
3	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	7300	2	
Water Closets							
ECO3 TOTAL:	が終めた。他のでは、これが、	LPF	The state of the s	LPF	#FL/YR	2	0
4							
Urinals							
14101							
ECO4 IOIAL:		LFIN		LPM	HRS/YR		0
2	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.5	245	2	0
Shower Heads							
ECO5 TOTAL:	東京   一方   一方   一方   一方   一方   一方   一方   一	TEMP		TEMP		2	0
9	40 GAL RHEEM IMPERIAL						
Water	CAPACITY: 30,000 BTU/H	334	REDUCE STORAGE TEMP	322	8760	-	
Heater	RECOVERY: ?		INSTALL INSUL JACKET	322	8760	-	
(GAS)							
14101001					g		
ECO6 IOIAL:				- 1 - 1 - 1	The state of the s	1	0

Systems Engineering and Management Corporation, Knoxville, TN

FACILITY NO.: Water Rate: 4859 A Gas Rate: ECO Number Annual Water						
Gas Rate: Annual Water	0.45	\$/KL		Energy Rate:		\$/KWH
Annual Water	10.51	\$/MWH		Demand Rate:		\$/KW
	Annual	Energy Sa	Saving	WATER	Total	Total
ECO Type	ELEC	ELEC	GAS	Dollar Saving	Dollar Saving	Dollare Invested
0			0	\$0.00	\$0.00	\$0.00
Lavatory Sinks 0			0	\$0.00	\$0.00	\$0.00
			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL: 0	0	0	0	\$0.00	\$0.00	\$0.00
<b>2</b> 0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks 0			0	\$0.00	\$0.00	\$0.00
0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL: 0	0	0	0	\$0.00	\$0.00	\$0.00
3 188,340				\$78.16	\$78.16	\$838.80
Water Closets 0				\$0.00	\$0.00	\$0.00
0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL: 188,340				\$78.16	\$78.16	\$838.80
4 0				\$0.00	\$0.00	\$0.00
Urinals 0				\$0.00	\$0.00	\$0.00
0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL: 0				\$0.00	\$0.00	\$0.00
<b>9</b>			0	\$0.00	\$0.00	\$0.00
Shower Heads 0			0	\$0.00	\$0.00	\$0.00
0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL: 0	0	0	0	\$0.00	\$0.00	\$0.00
6 EST ANNUAL						
Water HOT WTR			0.89		\$9.37	
Heater CONSUMPTION			7.70		\$80.96	\$60.00
(GAS) (LITERS)						
ECO6 TOTAL: 43,946	0	0	6	\$0.00	\$90.33	\$60.00

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT. KNOX WA	T. KN	OX WAYER CONSERVATION STUDY	S NOI	TUDY		102
	CAL	CULA.	CALCULATION WORK SHEET 1			DATE:	5 OCT 94
FACILITY NO. :	4870 C		FUNCTION:		UNACCON	UNACCOM PERS HOUS	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:		24 24	7 47 7	0
ECO Number	Existing Fixture System	_	Retrofited Fixture System	L L	Usage	Fixtures	Water Leaks
ECO Type	Description	LPM	Description	LPM	HRS/YR	Quantity	Eliminated LPY
-	SINK W/ AERATOR	9.5	NO RETROFIT	9.5	125	-	
Lavatory Sinks	SINK W/ AERATOR	11.4	NO RETROFIT	11.4	125	1	
ECO1 TOTAL:		LPM		LPM		2	0
2	KITCHEN SINK	11.4	NO RETROFIT	11.4	365	1	0
Misc. Sinks							
ECO2 TOTAL:		LPF		LPF	#FL/YR	-	0
3	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	7300	2	
Water Closets							
ECO3 TOTAL:		LPF		LPF	#FL/YR	2	0
4							
Urinals							
ECO4 TOTAL:		LPM		LPM	HRS/YR	0	0
5	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.5	245	1	0
Shower Heads							
ECO5 TOTAL:		TEMP		TEMP	A STATE OF THE STA	4	0
	40 GAL RHEEM IMPERIAL						
	CAPACITY: ?	334	REDUCE STORAGE TEMP	322	8760	-	
Heater	RECOVERY: ?		INSTALL INSUL JACKET	322	8760	1	
(GAS)							
FCO6 TOTAL .						-	c
100001					Wilder Commence		

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> 0							
١	Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
ŀ	te:	10.51	\$/MWH		Demand Rate:		\$/KW
ECO Number   Annual	Annual Water	Annual	Energy S	Saving	WATER	Total	Total
ECO Type Saying	LPY	ELEC		GAS	Dollar Saving	Dollar Saving	Dollare Invested
				0	\$0.00	\$0.00	\$0.00
Lavatory Sinks 0	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL: 0	0	0	0	0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks 0	0			0	\$0.00	\$0.00	\$0.00
0	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL: 0	0	0	0	0	\$0.00	\$0.00	\$0.00
3 188,340	,340				\$78.16	\$78.16	\$838.80
Water Closets 0	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL: 188,340	,340				\$78.16	\$78.16	\$838.80
<b>4</b>	0				\$0.00	\$0.00	\$0.00
Urinals 0	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL: 0	0				\$0.00	\$0.00	\$0.00
<b>2</b> 0	0			0	\$0.00	\$0.00	\$0.00
Shower Heads 0	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL: 0	0	0	0	0	\$0.00	\$0.00	\$0.00
Ш	NNUAL					100	
	Y			0.89		\$9.37	
	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS) (LITERS) 43 946	ERS)						
FCOR TOTAL	976	c	c	o	00 00	£00 32	00 099
	240			o.	90.00	430.33	\$60.00

Systems Engineering and Management Corporation, Knoxville, TN

10	5 OCT 94	UNACCOM PERS HOUS DET FAC	<u>o</u>	Water Leaks	Eliminated LPY			0	0		0			0			0	0		0					,	0
	DATE:	PERS HC			Quantity E			2	1		1	1		1			0	1		-		-	-			
TUDY		UNACCOM	24 24	Usage				を表したいった	365		#FL/YR	14600		#FL/YR			HRS/YR	245		#12 #13 #13 #14 #14 #14 #14 #14 #14 #14 #14 #14 #14		8760	8760			
S NOI		_,,	,	ш	LPM	9.5		LPM	9.5		LPF	6.1		LPF			LPM	9.5		TEMP		322	322			
. KNOX WAT CONSERVATION STUDY	CALCULATION WORK SHEET 1	FUNCTION:	Operating Hours:	Retrofited Fixture System	Description	NO RETROFIT			NO RETROFIT			1.6 GPF TANK TYPE TOILET						NO RETROFIT		in the second se		REDUCE STORAGE TEMP	INSTALL INSUL JACKET			
T. KN	CULAT				LPM	9.5		LPM	9.5		LPF	19		TPF			MdT	9.5		TEMP		334				
FY94S EEAP FT	CALC	5353 F	FAMILY	Existing Fixture System	Description	SINK W/ AERATOR			KITCHEN SINK			TANK TYPE						RESIDENTIAL TYPE			40 GAL RHEEM IMPERIAL	CAPACITY: ?	RECOVERY: ?			
		FACILITY NO.:	Occupancy:	ECO Number	ECO Type	1	Lavatory Sinks	ECO1 TOTAL:	2	Misc. Sinks	ECO2 TOTAL:	3	Water Closets	ECO3 TOTAL:	4	Urinals	ECO4 TOTAL:	5	Shower Heads	ECOS TOTAL:	9	Water	Heater	(GAS)		ECO6 TOTAL:

Systems Engineering and Management Corporation, Knoxville, TN

FACILITY NO.: Water Rate:	Doto:	9,0	1/11 +				*::AAH:
	L'alle.	0.42	4/K		Energy Rate:	3	#/KWH
Gas Rate:	ate:	10.51	\$/WWH		Demand Rate:		\$/KW
ECO Number Annu	Annual Water	Annual		Saving	WATER	Total	Total
ECO Type	Vd I pu	ELEC	ELEC	GAS	Dollar Saving	Dollar Saving	Dollars Invested
	ı	╅┈		0	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
3	188,340				\$78.16	\$78.16	\$418.80
Water Closets	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL: 18	188,340				\$78.16	\$78.16	\$418.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
5	0			0	\$0.00	\$0.00	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
	EST ANNUAL						
Water	HOT WTR			0.89		\$9.37	
	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS)						
	3,340						
ECO6 TOTAL: 43	43,946	0	0	6	\$0.00	\$90.33	\$60.00

Systems Engineering and Management Corporation, Knoxville, TN

FY94S WATER CONSERVATION STUDY (WATER AND ENERGY), FT. KNOX, KY

This section contains the project description and the DD1391 forms for ECIP Project FH-3, Family Housing Water Conservation Phase III improvements to 1,268 Family Housing Units. Two lists of the buildings included in the project follow the DD1391 forms. The first list includes all buildings considered in the project in numerical order. The second list shows which buildings were used to model unsurveyed buildings. Following these lists are the LCCID report and the cost estimate for the proposed project. Calculation sheets for the individual buildings follow the project cost estimate. Below is a detailed index of the information included in this section.

DD1391 Form	i-2
Table 5.1 ECIP FH-3 - Family Housing	5-6
Table 5.2 Buildings Modeled by Surveyed Buildings	
Project LCCID Report	
Catalog Cut Sheets/Product Information	
Project Cost Estimate	
Building Calculation Sheets	

DATE:

22 December 1994

PROJECT NO.:

ECIP-FH3

PROJECT TITLE:

Family Housing Water Conservation Phase III

INSTALLATION:

Fort Knox

LOCATION:

Kentucky

### PRIMARY FACILITY

Water Closets

\$981,000

ESTIMATED CONTRACT COST	\$810,000
CONTINGENCY PERCENT (10%)	81,000
SUBTOTAL	891,000
SUPERVISION, INSPECTION & OVERHEAD (5%)	44,550
DESIGN COST	44,550
TOTAL REQUEST	980,100
TOTAL REQUEST (ROUNDED)	\$981,000

Replace water closets in 1268 family housing units with water saving, 6 liters (1.6 gallons) per flush water closets. All water closets will be of the flush tank type. The project will significantly reduce potable water consumption and sanitary waste production.

DATE:

22 December 1994

PROIECT NO .:

ECIP-FH3

PROJECT TITLE:

Family Housing Water Conservation Phase III

INSTALLATION:

Fort Knox

LOCATION:

Kentucky

### PROJECT:

Replace water closets in 1268 family housing units with water saving, 6 liters (1.6 gallons) per flush water closets.

### REQUIREMENTS:

Fort Knox utilizes inefficient outdated water closets in its family housing units. The existing water closets consume significantly more water and generate greater quantities of sanitary waste per flush than the new standard water saving water closet. The existing inefficient systems place greater demand on the water table, water treatment plant and waste treatment plant. The U.S. Army Corp of Engineers, Louisville District, contracted an Energy Engineering Analysis Program (EEAP) Water Conservation Study of the Post. The study identified energy and water conservation opportunities. Life cycle cost analysis was performed on each opportunity to determine its discounted savings-to-investment ratio (SIR) and estimated payback period. This project has a SIR of 2.24 and a simple payback period of 6.63 years. The project exceeds the minimum requirements of an SIR greater than 1.25 and a simple payback of less than 10 years.

### **CURRENT SITUATION:**

The family housing units at Ft. Knox have inefficient water closets. The family housing units consume more water and generate more sanitary waste than is necessary. The new water closets will greatly reduce the water consumption and waste generated.

### IMPACT IF NOT PROVIDED:

If this project is not implemented, 1268 family housing units will continue to consume more water and generate more waste than necessary. The U.S. Army will fail to realize an estimated \$148K in annual savings (FY95\$) and a total discounted savings of \$2.2M during the twenty year life of the project.

### ADDITIONAL:

A life cycle cost analysis was performed on the project. The project will realize water savings of over 2.2 times the initial investment cost and will pay for itself in less than 6.7 years.

Ft. Knox is not on the list of installations considered for closure or realignment.

DATE:

22 December 1994

PROJECT NO.:

ECIP-FH3

PROJECT TITLE:

Family Housing Water Conservation Phase III

INSTALLATION:

Fort Knox

LOCATION:

Kentucky

SECTION 11 - ECONOMIC ANALYSIS DATA

11D ECONOMIC JUSTIFICATION SUMMARY

This water conservation project is recommended for funding. A life cycle cost analysis was performed on each portion of this project and on the overall project. The overall project will realize water savings of over 2.2 times the initial investment cost and will pay for itself in less than 6.7 years.

TABLE 5.1 ECIP FH-3 - FAMILY HOUSING

5201 A II	5423 A-D	5548 A-D	5849 B
5301 A-H	5424 A-D	5551 A-H	5850 A-D
5305 A-H	1	5551 A-H	5851 A, B
5308 A-G	5425 A-H	5552 A-H	5852 A-D
5309 A-D	5426 A-D	5553 A	5853 A, B
5312 A-D	5428 A-D		5872
5313 A-D	5429 A-D	5553 B - 5567 B	:
5314	5430 A-D	5560 A	5873 A - 5885 A, B
5318 A-D	5431 A-D	5562 A - 5577 A	5897 A,B
5319 A-D	5434 A-H	5568	
5324 A-H	5435 A-H	5569 B - 5577 B	
5325 A-H	5437 A-D	5600 AQ	
5328 A-H	5440 A-D	5600 B	
5331 A-D	5443 A-D	5602 A	
5333 A-D	5445 A-D	5602 B - 5641 B	
5335 A-D	5446 AQ-H	5641 A	
5337 A-H	5447 A-H	5642 A-H	
5338 A-D	5448 A-D	5642 A-H	
5339 A-H	5451 A-D	5643 A	
5341 A-D	5452 A-H	5643 B	
5342 A-H	5453 A-D	5644 A-H	
5343 A-D	5455 A-H	5645 A	
5345 A-D	5458 A-D	5645 B	
5346 A-H	5459 A-H	5647 A	
5349 A-H	5460 A-D	5647 B	
5350 A-D	5462 A-D	5648 A-D	
5351 A-H	5464 A-D	5652 A-D	
5352 A-H	5465 A-H	5653 A - 5671 A	
5356 A-H	5467 A-H	5653 B - 5671 B	
5359 A-D	5468 A-D	5661	
5363 A-D	5469 A-D	5700 A - 5701 A	
5369 A-D	5470 A-H - 5475 A-C	5700 B - 5701 B	
5371 A-D	5475	5703 A	
5372 A-D	5475 E-H - 5478 A-H	5703 B	
5402 A-H	5476 A-H	5705 A - 5780 A	·
5405 A-H	5480 A-H	5705 B - 5760 B	
5406	5480 A-H	5800 A-D	
5408 A-H	5481 A-D	5801 A, B	
5410 A-D	5482 A-D	5802 A-D	
5413 A-H	5483 A-H - 5491 A-H	5803 A, B - 5817 A, B	
5414 A-D	5486 A-H	5818 A	
5416 A-D	5489 A-H	5818 B - 5747 B	
5418 A-D	5491 A-D	5847 A	
5419 A-H	5493 A-D	5848 A-D	
5420 A-H	5494 A-H	5849 A	
3420 A-II	JAPA CAL	70-т/ Л	

TABLE 5.2 BUILDINGS MODELED BY SURVEYED BUILDINGS

BUILDINGS SURVEYED AND CALCULATED	BUILDINGS ASSUMED TYPICAL OF SURVEYED BUILDINGS
5568	5553B - 5567B, 5569B - 5577B, 5600B, 5602B - 5641B, 5643B, 5645B, 5647B, 5653B - 5671B, 5700B - 5701B, 5703B, 5705B - 5760B, 5818B - 5847B, 5749B
5661	5553A - 5560A, 5562A - 5577A, 5600A, 5602A - 5641A, 5643A, 5645A, 5647A, 5653A - 5671A, 5700A - 5701A, 5703A, 5705A - 5760A, 5818A - 5847A, 5849A
5672	5673A & B - 5685A & B, 5801A & B, 5803A & B - 5817A & B, 5851A & B, 5853A & B - 5897A & B
5314	5308A-D, 5309A-D, 5312A-D, 5313A-D, 5318A-D, 5319A-D, 5331A-D - 5333A-D, 5335A-D, 5338A-D, 5341A-D, 5343A-D, 5345A-D, 5350A-D, 5359A-D - 5363A-D, 5369A-D, 5371A-D, 5372A-D, 5410A-D, 5414A-D, 5416A-D, 5418A-D, 5423A-D, 5424A-D, 5426A-D, 5428A-D, 5429A-D, 5431A-D, 5437A-D, 5430A-D, 5440A-D, 5443A-D, 5445A-D, 5448A-D, 5451A-D, 5453A-D, 5456A-D, 5460A-D, 5462A-D - 5464A-D, 5468A-D, 5469A-D, 5481A-D, 5482A-D, 5491A-D, 5493A-D, 6546A-D, 5648A-D - 5652A-D, 5800A-D, 5802A-D, 5848A-D, 5850A-D, 5852A-D
5406	5465A-H - 5467A-H, 5470A-H - 5475A-C, 5475E-H - 5478A-H, 5480A-H, 5483A-H - 5491A-H, 5494A-H, 5551A-H, 5552A-H, 5642A-H, 5644A-H
5475	
9053*	53014A-H, 5305A-H, 5324A-H, 5325A-H, 5328A-H, 5337A-H, 5339A-H, 5342A-H, 5346A-H, 5349A-H, 5351A-H, 5352A-H, 5356A-H, 5402A-H, 5405A-H, 5408A-H, 5413A-H, 5419A-H, 5420A-H, 5425A-H, 5434A-H, 5435A-H, 5446A-H, 5447A-H, 5452A-H, 5455A-H, 5459A-H, 5476A-H, 5480A-H, 5486A-H, 5489A-H, 5551AQ-H, 5642A-H  *Surveyed building not included in this project. It is covered under Project Group 1.

STUDY: ECIP-FH3 LCCID FY95 (92) LIFE CYCLE COST ANALYSIS SUMMARY ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) INSTALLATION & LOCATION: FT KNOX REGION NOS. 4 CENSUS: 3 PROJECT NO. & TITLE: ECIP-FH3 FAMILY HOUSING PROJECT 3 FISCAL YEAR 1995 DISCRETE PORTION NAME: WATER ANALYSIS DATE: 12-27-94 ECONOMIC LIFE 20 YEARS PREPARED BY: DERRINGTON 1. INVESTMENT A. CONSTRUCTION COST \$ 891000. Ś 44550. B. SIOH C. DESIGN COST \$
D. TOTAL COST (1A+1B+1C) \$ 44550. 980100. E. SALVAGE VALUE OF EXISTING EQUIPMENT \$ 0. F. PUBLIC UTILITY COMPANY REBATE 0. 980100. G. TOTAL INVESTMENT (1D - 1E - 1F) Section 40 2. ENERGY SAVINGS (+) / COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994 UNIT COST SAVINGS ANNUAL \$ DISCOUNTED MWH/YR(2) SAVINGS(3) FACTOR(4) SAVINGS(5) S/ MWH(1) 0. A. ELECT \$ 46.40 0. 15.08 0. 18.57 0. 0. 0. B. DIST \$ .00 .00 C. RESID \$ 0. 21.02 0. 0. 0. D. NAT G \$ 10.51 0. 18.58 0. 0. 0. 16.83 E. COAL \$ .00 0. Ο. 17.38 0. F. PPG S .00 0. 14.88 0. M. DEMAND SAVINGS 0. 0. N. TOTAL 3. NON ENERGY SAVINGS (+) / COST (-) 98900. A. ANNUAL RECURRING (+/-) (1) DISCOUNT FACTOR (TABLE A) 14.88 (2) DISCOUNTED SAVING/COST (3A X 3A1) \$ 1471632. B. NON RECURRING SAVINGS (+) / COSTS (-) SAVINGS (+) YR DISCNT DISCOUNTED FACTR SAVINGS(+) OC SAVINGS(+)/ ITEM COST(-) (3) COST(-)(4) (1) (2) 10 \$ 980100. .74 725274. 1. REPLACEMENT 725274. \$ 980100. d. TOTAL C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 2196906. 4. FIRST YEAR DOLLAR SAVINGS 2N3+3A+(3Bd1/(YRS ECONOMIC LIFE))\$ 147905. 6.63 YEARS 5. SIMPLE PAYBACK PERIOD (1G/4) \$ 2196906. 6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) (SIR) = (6 / 1G) =2.24 7. SAVINGS TO INVESTMENT RATIO (IF < 1 PROJECT DOES NOT QUALIFY) \*\*\*\* Project does not qualify for ECIP funding; 4,5,6 for information only. N/A

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR):



- · Water-saving 1.5 gallon flush.
- Features Pressure-Clean™ flushometer tank system.
- Three-bolt quick connect system with factory-installed tank gasket and bolts.

K-3458 Wellworth Lite PC Toilet, vitreous china, 1.5 gallon flush. Close-coupled design with elongated bowl. Minimum roughing-in is 12" (305 mm).

Tank/bowl combination includes K-4333 bowl, K-4470 vitreous china tank with Kohler 81100 flushometer tank system, K-4471 tank cover and K-9434 chrome-plated trip lever.

IMPORTANT—For most satisfactory operation, a minimum static water pressure of 25 P.S.I. is required at the toilet supply inlet.

Recommended Seats and Supply K-4650 Lustra<sup>™</sup> solid plastic seat with open front and cover.

**K-4652** Lustra solid plastic seat with closed front and cover.

K-4670-C Lustra solid plastic seat (K-4681-C Black Black™) with open front and check hinge.

K-7637 %" angle supply with stop.

Tank Locks—Add suffix "-T" to product number.

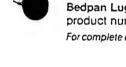
Bedpan Lugs - Add suffix "-L" to product number.

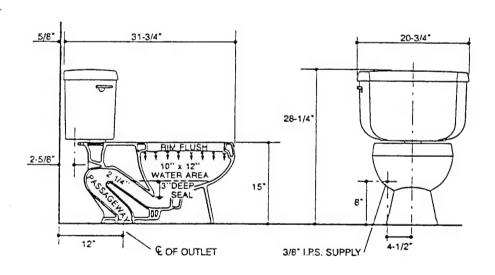
For complete color selection, see Colors section.



Wellworth Lite PC Toilet and Lustra seat (K-4652) in White.

U.S. Pat. Pending









\$0 \$742,618

Estimate: ECO - 3 Date: 15-Dec-94
Description: INSTALL WATER CLOSETS - FAMILY HOUSING
Project: LIMITED EEAP (WTR)Bid Date:
Location: FORT KNOX, KY Job #: 94013.03
Sq. footage: FAM HSG - GP 3 City indx:Louisville, KY

Line # Description

Manhours Matl Labor Equipment Sub Total

1521801100 ECO - 3 INSTALL NEW WATER SAVING WATER CLOSET, TANK TYPE, FLOOR MNTD, 2PC WHITE W/SEAT, 1.6 GPF 2126.00 Ea.
Unit values 4.02 235.00 114.30 0.00 0.00 349.30 Totals 8546.52 \$499,610 \$243,008 \$0 \$0 \$742,618

U15 MECHANICAL 8547 \$499,610 \$243,008 \$0

	========		=======		========	========
Line #	Descript	ion				
	Manhours	Matl	Labor	Equipment	Sub	Total
==========			.=======	========		
ESTIMATE TOTAL	8547	\$499,610	\$243,008	\$0	\$0	\$742,618
SALES TAX MATL MARKUP LABOR MARKUP	0.00% 0.00% 0.00%	\$0 \$0	\$0			
EQUIPT MARKUP SUB MARKUP	0.00%		ŞU	\$0	\$0	
TOTAL BEFORE C CONTINGENCY BOND PROFIT	ONTINGENC 10.00% 0.00% 10.00%	\$499,610	\$243,008	\$0	\$0	\$742,618 \$74,262 \$0 \$74,262
JOB TOTAL						\$891,142

\$891,142

Estimate: ECO - 3 Date: 15-Dec-94
Description: INSTALL WATER CLOSETS - FAMILY HOUSING
Project: LIMITED EEAP (WTR)Bid Date:
Location: FORT KNOX, KY Job #: 94013.03
Sq. footage: FAM HSG - GP 3 City indx:Louisville, KY

JOB TOTAL

	5	SUMMARY				
	Manhours	Matl	Labor	Equipment	Sub	Total
=======================================					=======	
U15 MECHANICAL	8547	\$499,610	\$243,008	\$0	\$0	\$742,618
TOTAL	8547	\$499,610	\$243,008	\$0	\$0	\$742,618
SALES TAX MATL MARKUP	0.00% 0.00%	\$C \$0				
LABOR MARKUP EQUIPT MARKUP SUB MARKUP	0.00% 0.00% 0.00%		\$0	\$0	\$0	
TOTAL BEFORE COCONTINGENCY BOND PROFIT	ONTINGENC 10.00% 0.00% 10.00%	\$499,610	\$243,008	\$0	\$0	\$742,618 \$74,262 \$0 \$74,262

	FY94S EEAP FT	T. KN	. KNOX WAT CONSERVATION STUDY	S NO	TUDY		10
	CAL	CULAT	X			DATE:	5 OCT 94
FACILITY NO. :	5314 D		FUNCTION:	•	UNACCOM PERS HOUS	A PERS	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:	·	24 24	067 10	
ECO Number	Existing Fixture System		Retrofited Fixture System	٦	Usage	Fixtures	Water Leaks
ECO Type	Description	LPM	Description	LPM	<b>HRS/YR</b>	Quantity	Eliminated LPY
1 Lavatory Sinks	SINK W/ AERATOR	9.5	NO RETROFIT	9.5	125	2	
ECO1 TOTAL:		LPM		LPM		2	0
2 Misc. Sinks	KITCHEN SINK	9.5	NO RETROFIT	9.5	365	1	0
ECO2 TOTAL:		LPF		LPF	#FL/YR	-	0
Water Closets	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	14600	-	
Water Closers							
ECO3 TOTAL:		LPF		LPF	#FL/YR	1	0
4 Urinals							
- TOTA TOTAL							d
ECO4 IOIAL:				7	HKS/YK		0
5 Shower Heads	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.5	245	~	55640
ECO5 TOTAL:		TEMP		TEMP		-	55640
9	40 GAL FURY						
Water	C	334	REDUCE STORAGE TEMP	322	8760	-	
Heater (GAS)	RECOVERY: ?		INSTALL INSUL JACKET	322	8760	~	
ECO6 TOTAL:						-	0

SYSTEMS CORP

	FY94S EEAP FT. KNOX	FT. KNC		WATER CON	RVATION STUDY	TUDY	2 OF 2
		Ö		TION WO	노		
FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
2 <del>1</del> 2 3	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
ECO Number	Annual Water	Annua	l Energy	Saving	WATER	Total	Total
ECO Type	Saving LPY	ELEC	ELEC ELEC KW KWH	GAS	Dollar Saving	Dollar Saving	Dollars Invested
1	1			J	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
3	188,340				\$78.16	\$78.16	\$418.80
Water Closets	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$418.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
5	55,640			96	\$23.09	\$1,034.18	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	55,640	0	0	96	\$23.09	\$1,034.18	\$0.00
9	EST ANNUAL						
Water	HOT WTR			0.89		\$9.37	
Heater	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS)						
	43,946						
ECO6 TOTAL:	43,946	0	0	6	\$0.00	\$90.33	\$60.00
SYSTEMS CORP	ORP			Systems	Engineering and	Management Cor	Systems Engineering and Management Corporation, Knoxville, TN
					)	>	

Systems Engineering and Management Corporation, Knoxville, TN

	THE APER ELAP ET	T KN	KNOX WAT	NO	TIIDY		10
	CALC	CULAT	X			DATE:	5 OCT 94
FACILITY NO.:	5406 E		FUNCTION:		UNACCO	M PERS	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:	·	24	UF 216 U	0
ECO Number	Existing Fixture System		Retrofited Fixture System	ш	Usage	Fixtures	Water Leaks
ECO Type	Description	LPM	Description	LPM	<b>HRS/YR</b>	Quantity	Eliminated LPY
1 Lavatory Sinks	SINK W/ AERATOR	9.5	NO RETROFIT	9.5	125	2	
ECO1 TOTAL:		P		I PM		2	0
2	KITCHEN SINK	9.5	NO RETROFIT	9.5	365	1	0
Misc. Sinks							
ECO2 TOTAL:		LPF		LPF	#FL/YR	1	0
Motor Clocoto	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	7300	2	
Water Closers							
ECO3 TOTAL:		LPF		LPF	#FL/YR	2	0
4							
OFFIGE							
ECO4 TOTAL:		LPM	# 10 m	LPM	HRS/YR	0	0
5	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.5	245	1	166918.5
Shower neads							
ECO5 TOTAL:		TEMP		TEMP	A Section of the Control of the Cont	-	166918.5
9	. )						
Water	C-	334	REDUCE STORAGE TEMP	322	8760	-	
Heater (GAS)	RECOVERY: ?		INSTALL INSUL JACKET	322	8760	-	
ECO6 TOTAL:						1	0

Systems Engineering and Management Corporation, Knoxville, TN

FACILITY NO.:         Water Rate:         0.42         \$/K/L         Energy Rate:         \$/K/VH           5406 E         Gas Rate:         10.51         \$/MWH         Demand Rate:         \$/K/WH           ECO Number         Annual Water         Annual Fineray Saving         WATER         Total         Total           ECO Type         Saving LPY         KWH         MWH         Dollar Saving         S0.00         \$	: Water Rate: 0.4  Gas Rate: 10.5  ELEC Saving LPY KW 0 0 0 0 0 0 0 0 188,340 0 188,340 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$/MVH  Energy Saving ELEC GAS KWH MWH  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Energy Rate:  WATER  WATER  \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00		\$/KW\ Total  Total  Dollars Invested \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
Gas Rate:         10.51         \$\text{MVMH}\$         Demand Rate:         \$\text{KVM}\$         \$\text{MVMTER}\$         Total         \$\text{KVM}\$         \$\text{MVMTER}\$         Total         \$\text{S/MVM}\$           CO Type         Saving LPY         KW         KWH         MWH         Dollar Saving         \$\text{DO10}\$         \$\text{S/0.00}\$           CO Ty Sinks         0         0         0         \$\text{S,0.00}\$         \$\text{S,0.00}\$	Gas Rate:         10.51           Number         Annual Water         Annual LEC           Co Type         Saving         LPY         KW           1         0         0         0           tory Sinks         0         0         0           2         0         0         0           2c. Sinks         0         0         0           TOTAL:         0         0         0           3         188,340         0         0           TOTAL:         188,340         0         0           TOTAL:         188,340         0         0           4         0         0         0           4         0         0         0           1rinals         0         0         0	_  ŏ	WATER  WATER  Dollar Saving  \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00		\$/KW  Total  Dollars Invested \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
O TUTPLE         Saving LPY RWH FRMH         Annual Energy Saving LPY RWH         Annual Energy Saving LPM RWH         MANH PRM RWH         Dollar Saving Dollar Saving S0.00         Total           1 O TOTAL:         0         0         \$0.00         \$0.00         \$0.00           1 OTAL:         0         0         \$0.00         \$0.00         \$0.00           1 OTAL:         0         0         \$0.00         \$0.00         \$0.00           1 COTAL:         0         \$0.00         \$0.00         \$0.00         \$0.00           1 COTAL:         0         \$0.00         \$0.00         \$0.00         \$0.00           1 COTAL:         0         \$0.00         \$0.00         \$0.00         \$0.00           2 EST ANNUAL:         0         \$0.00         \$0.00         \$0.00         \$0.00           6 EST ANNUAL:         0         0<	er Annual Water Annual  Saving LPY KW  0 0 0 0 0 0 0 0 0 188,340 0 188,340 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	lő — I I I I I I I I I I I I I I I I I I	### WATER    Dollar Saving     \$0.00	Total  Dollar Saving  \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	Total  Dollars Invested  \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
O Type         Saving LPY KW         KWH KWH         MWH MWH         Dollar Saving \$0.00         F0.00         S0.00	tory Sinks		\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00
tory Sinks         0         60.00         \$0.00         \$0.00           tory Sinks         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           TOTAL:         188,340         0         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           Acronal         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         166,919         0         \$0.00         \$0.00           5         166,919         0         \$0.00         \$0.00           6         EST ANNUAL         0         \$0.00         \$0.00           6         HOT WATR	tory Sinks 0  TOTAL: 0  5c. Sinks 0  TOTAL: 0  TOTAL: 0  TOTAL: 0  3 188,340  er Closets 0  TOTAL: 188,340  Jrinals 0		\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00\$
tory Sinks         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           Ec. Sinks         0         0         \$0.00         \$0.00           sc. Sinks         0         0         0         \$0.00           sc. Sinks         0         0         0         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           ar Closets         0         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           Acronal         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         166,919         0         \$0.00         \$0.00         \$0.00           50.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           6         ESTANNUAL         0.89         \$69.27         \$3,102.50         \$0.00	tory Sinks 0  TOTAL: 0  sc. Sinks 0  TOTAL: 0  TOTAL: 0  ar Closets 0  TOTAL: 188,340  A 0  Jrinals 0		\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$78.16 \$0.00	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$0.00 \$0.00 \$0.00
TOTAL:         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           c. Sinks         0         0         \$0.00         \$0.00           cc. Sinks         0         0         \$0.00         \$0.00           TOTAL:         0         0         0         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00           TOTAL:         166,919         0         \$0.00         \$0.00	10TAL: 0 2 0 2 0 3 0 10TAL: 0 188,340 3 188,340 4 0 10TAL: 188,340 4 0 0 0		\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$78.16	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$0.00 \$0.00
TOTAL:         0         0         0         \$0.00           2         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           sc. Sinks         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           3         188,340         0         \$0.00         \$0.00           3 r Closets         0         0         \$0.00         \$0.00           3 r Closets         0         \$0.00         \$0.00         \$0.00           1 r Closets         0         \$0.00         \$0.00         \$0.00           2 r Closets         0         \$0.00         \$0.00         \$0.00           3 r Closets         0	TOTAL: 0  2c. Sinks 0  TOTAL: 0  3 188,340  ar Closets 0  TOTAL: 188,340  4 0  Jrinals 0		\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$78.16	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00	<b>\$0.00</b>
2         0         \$0.00         \$0.00           sc. Sinks         0         \$0.00         \$0.00           sc. Sinks         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           st Closets         0         0         \$0.00         \$0.00           st Closets         0         \$0.00         \$0.00         \$0.00           st Closets         0         \$0.00         \$0.00         \$0.00           st Closets         0         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00         \$0.00           Jrinals         0         \$0.00         \$0.00         \$0.00           Jrinals         0         \$0.00         \$0.00         \$0.00           Jrinals         0         \$0.00         \$0.00         \$0.00           Acriticals         0         \$0.00         \$0.00         \$0.00           Acriticals         0         \$0.00         \$0.00         \$0.00         \$0.00           Acriticals         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           Color	2 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		\$0.00 \$0.00 \$0.00 <b>\$0.00</b> \$78.16 \$0.00	\$0.00 \$0.00 \$0.00 \$0.00	\$0.00
sc. Sinks         0         \$0.00         \$0.00           Social Signer         \$0.00         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           ST Closets         0         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         0         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         0         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           Fe         166,919         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           Aver Heads         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           Aver Heads         0         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00	ic. Sinks 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		\$0.00 \$0.00 <b>\$0.00</b> \$78.16 \$0.00	\$0.00 \$0.00 \$0.00 \$78.16	
TOTAL:         0         0         \$0.00         \$0.00           3         188,340         0         \$0.00         \$0.00           ar Closets         0         \$0.00         \$0.00           ar Closets         0         \$0.00         \$0.00           TOTAL:         188,340         \$0.00         \$0.00           Ininals         0         \$0.00         \$0.00           F         166,919         \$0.00         \$0.00         \$0.00           F         166,919         0         \$0.00         \$0.00         \$0.00           F         166,919         0         \$0.00         \$0.00         \$0.00           F         EST ANNUAL         0.89         \$69.27         \$3,102.50           GAS)         (LITERS)         7.70         \$80.96           GAS)         43,946         0         9         \$0.00           TOTAL:         43,946         0         9	10TAL: 0 3 188,340 ar Closets 0 10TAL: 0 4 0 Jrinals 0		\$0.00 \$0.00 \$78.16 \$0.00	\$0.00 <b>\$0.00</b> \$78.16	\$0.00
TOTAL:         0         0         \$0.00         \$0.00           3         188,340         0         \$0.00         \$78.16         \$78.16           ar Closets         0         \$0.00         \$0.00         \$0.00         \$0.00           TOTAL:         188,340         0         \$0.00         \$0.00         \$0.00           TOTAL:         0         \$0.00         \$0.00         \$0.00         \$0.00           Ininals         0         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           Ininals         0         \$0.00	TOTAL: 0  3		\$0.00 \$78.16 \$0.00	\$0.00	\$0.00
its         \$78.16         \$78.16           its         0         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           10         \$0         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           4s         \$0         \$0.00         \$0.00           \$consumption         \$0.00         \$0.00         \$0.00           \$consumption         \$0.89         \$69.27         \$3,102.50           CONSUMPTION         \$0.89         \$69.27         \$30.00           43,946         \$0         \$0         \$0.00           \$0         \$0.00         \$0.00         \$0.00           \$0.00         \$0.00         \$0.00         \$0.00           \$0         \$0.00         \$0.00         \$0.00	st		\$78.16	£78 16	\$0.00
ifs         0         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           4s         0         \$0.00         \$0.00           4s         0         \$0.00         \$0.00           EST ANNUAL         0.89         \$69.27         \$3,102.50           HOT WITE         0.89         \$69.27         \$3,102.50           CONSUMPTION         7.70         \$80.96           43,946         0         9         \$0.00           43,946         0         9         \$0.00	st):		\$0.00	2	\$838.80
0         \$0.00         \$0.00           188,340         \$78.16         \$78.16           0         \$0.00         \$0.00           0         \$0.00         \$0.00           166,919         0         \$0.00         \$0.00           4s         0         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00         \$0.00           HOT WTR         0.89         \$69.27         \$3,102.50         \$0.00           CONSUMPTION         7.70         \$80.00         \$0.00           43,946         0         9         \$0.00         \$90.33			UU U\$	\$0.00	\$0.00
188,340         \$ 578.16         \$ 78.16           0         \$ 0.00         \$ 0.00         \$ 0.00           0         \$ 0.00         \$ 0.00         \$ 0.00           4s         \$ 0         \$ 0.00         \$ 0.00           43,946         \$ 0         \$ 0         \$ 0.00           40         \$ 0         \$ 0.00         \$ 0.00           43,946         \$ 0         \$ 0         \$ 80.37           43,946         \$ 0         \$ 0.00         \$ 80.33			φν.νο	\$0.00	\$0.00
0         \$0.00         \$0.00           0         \$0.00         \$0.00           166,919         289         \$69.27         \$3,102.50           166,919         0         \$0.00         \$0.00           166,919         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WTR         0.89         \$69.27         \$3,102.50           CONSUMPTION         7.70         \$60.00         \$0.00           43,946         0         9         \$0.00         \$90.33			\$78.16	\$78.16	\$838.80
0         \$0.00         \$0.00           0         \$0.00         \$0.00           4st 946         \$0.00         \$0.00           43,946         0         \$0.00         \$0.00           4st 946         0         0         \$0.00         \$0.00			\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.	C		\$0.00	\$0.00	\$0.00
i.e         0         \$0.00			\$0.00	\$0.00	\$0.00
Ids         166,919         \$69.27         \$3,102.50           Ids         0         \$0.00         \$0.00           :         166,919         0         \$0.00         \$0.00           :         166,919         0         289         \$69.27         \$3,102.50           :         166,919         0         0         \$6.00         \$0.00           EST ANNUAL         0.89         \$69.27         \$3,102.50         80.00           HOT WIR         0.89         \$69.37         \$80.96         80.96           CONSUMPTION         7.70         \$80.96         80.96         80.37           43,946         0         9         \$0.00         \$90.33			\$0.00	\$0.00	\$0.00
tds         0         \$0.00		289	\$69.27	\$3,102.50	\$0.00
0         0         \$0.00         \$0.00           EST ANNUAL         0.89         \$69.27         \$3,102.50           HOT WTR         0.89         \$9.37           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         9         \$0.00         \$90.33		0	\$0.00	\$0.00	\$0.00
166,919         0         0         289         \$69.27         \$3,102.50           EST ANNUAL         0.89         \$9.37           HOT WTR         0.89         \$9.37           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         9         \$0.00         \$90.33			\$0.00	\$0.00	\$0.00
EST ANNUAL       0.89       \$9.37         HOT WTR       7.70       \$80.96         CONSUMPTION       7.70       \$80.96         (LITERS)       43,946       0       9       \$0.00       \$90.33	: 166,919		\$69.27	\$3,102.50	\$0.00
CONSUMPTION 7.70 \$80.96 (LITERS) 43,946 0 0 9 \$60.00 \$90.33		C		1000	
CONSUMPTION 7.70 \$80.96 (LITERS) 43,946 0 0 9 \$0.00 \$90.33		0.89		\$9.37	
(LITERS) 43,946 0 0 9 \$0.00 \$90.33		7.70		\$80.96	\$60.00
43,946 0 0 9 \$0.00 \$90.33					
43,946 0 0 9 \$0.00 \$90.33	43,340				
	43,946		\$0.00	\$90.33	\$60.00

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT	. KN	. KNOX WAT CONSERVATION STUDY	S NOI	TUDY		10
	CALC	ULAT	ス			DATE:	5 OCT 94
FACILITY NO. :	5475 D		FUNCTION:	1-	UNACCOM PERS HOUS	A PERS	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:	'	24	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0
ECO Number	Existing Fixture System		Retrofited Fixture System	, ,		Fixtures	Water Leaks
ECO Type	Description	LPM	Description	LPM o 5	HRS/YR	Quantity	Eliminated LPY
Lavatory Sinks		5		2.	031	7	
FCO1 TOTAL		MO		Md		2	C
2	KITCHEN SINK	9.5	NO RETROFIT	9.5	365	-	0
Misc. Sinks							
ECO2 TOTAL:		LPF		LPF	#FL/YR	1	0
3	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	7300	2	
Water Closets							
ECO3 TOTAL:		LPF		LPF	#FL/YR	2	0
4							
Urinals							
ECO4 TOTAL:		LPM		LPM	HRS/YR	0	0
2	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.5	245	1	0
Shower Heads							
ECO5 TOTAL:		TEMP		TEMP		1	0
9	$\cup$						
Water	CAPACITY: ?	334	REDUCE STORAGE TEMP	322	8760	-	
(GAS)	NECOVERT:		INOTALL INOUL JACKET	326	00/0	-	
ECO6 TOTAL:				i Şv		1	0
P							

	FY94S EEAP FT. KNOX N	FT. KNO	X WATE	WATER CON	YCUTS NOITAYA	YOUT	2 OF 2
		ď	LCULAT	IOM MOI	노		
FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
ECO Number	Annual Water	Annual	Energy	Saving	WATER	Total	Total
ECO Type	Saving LPY	ELEC KW	ELEC	GAS	Dollar Saving	Dollar Saving	Dollars Invested
1				0	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
3	188,340				\$78.16	\$78.16	\$838.80
Water Closets	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$838.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
5	0			0	\$0.00	\$0.00	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
9	EST ANNUAL						
Water	HOT WTR			0.89		\$9.37	
Heater	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS)						
	43,946						
ECO6 TOTAL:	43,946	0	0	6	\$0.00	\$90.33	\$60.00
CVCTEMS COPP	ODD			Cyclomo	Engine oning	Monogonopt Cor	
	L 40			Systems	з Епдіпеегіну ан	Systems Engineering and Management Corporation,	poration, Anoxviile, IN

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT	. KN	. KNOX WAT CONSERVATION STUDY	S NOI	TUDY		7 (
	CALC	ULAI	CALCULATION WORK SHEET 1			DATE:	5 OCT 94
FACILITY NO. :	5568 B		FUNCTION:		UNACCO	A PERS	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY (3BR)		Operating Hours:		17PICAL OF 188 UNITS 24	OF 188 U	SLIN
ECO Number	Existing Fixture System		Retrofited Fixture System		Usage	Fixtures	Water Leaks
ECO Type	Description		Description	LPM	HRS/YR	Quantity	Eliminated LPY
1 avatory Sinke	SINK W/ AERATOR	9.5	NO RETROFIT	9.5	125	2	
Lavatory Office							
ECO1 TOTAL:		LPM		LPM	William State of the Control of the	2	0
2	KITCHEN SINK	9.5	NO RETROFIT	9.5	365	-	0
Misc. Sinks							
ECO2 TOTAL:		LPF		LPF	#FL/YR	-	0
က	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	7300		
Water Closets							
ECO3 TOTAL:		LPF	7 を影り第 7 2	LPF	#FL/YR	2	0
4							The state of the s
Urinals							
ECO4 TOTAL:		LPM		LPM	HRS/YR	0	0
2	RESIDENTIAL TYPE	5.68	NO RETROFIT	5.68			0
Shower Heads							
ECO5 TOTAL:		TEMP		TEMP	200	-	0
9	40 GAL STATE						
Water		334	REDUCE STORAGE TEMP	322	8760	1	
Heater (GAS)	KECOVERY: 7		INSTALL INSUL JACKET	322	8760	-	
ECO6 TOTAL:						-	0

	<b>FY94S EEAP FT. KNOX</b>	FT. KNC		WATER CON	RVATION STUDY	TUDY	2 OF 2
		C)	ALCULA <sup>-</sup>	TION WO	꽃		
FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
ECO Number	Annual Water	Annua	Annual Energy	Saving	WATER	Total	Total
ECO Type	Saving LPY	ELEC	ELEC	GAS	Dollar Saving	Dollar Saving	Dollars Invested
1	0			0	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
3	188,340				\$78.16	\$78.16	\$838.80
Water Closets	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$838.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
5	0			0	\$0.00	\$0.00	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
9	EST ANNUAL						
Water	HOT WTR			0.89		\$9.37	
Heater	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS)	;					
	43,946						
ECO6 TOTAL:	43,946	0	0	6	\$0.00	\$90.33	\$60.00
SYSTEMS CORP	ORP			Systems	Engineering and	Systems Engineering and Management Corporation,	poration, Knoxville, TN
				•	,	)	

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT.		KNOX WAT CONSERVATION STUDY	S NO	TUDY		10
	CALC	CULAT	CALCULATION WORK SHEET 1			DATE:	5 OCT 94
FACILITY NO.:	5661 A		FUNCTION:	<b>—</b> µ	JNACCOL	UNACCOM PERS HOUS	UNACCOM PERS HOUS DET FAC
Occupancy:	FAMILY (3BR)		Operating Hours:	1	24 24		
ECO Number	Existing Fixture System	1	Retrofited Fixture System	٥	Usage	Fixtures	Water Leaks
ECO Type	Description		Description	LPM	HRS/YR	Quantity	Eliminated LPY
1 Lavatory Sinks	SINK W/ AERATOR	9.5	NO RETROFII	9.5	125	7	
ECO1 TOTAL:		LPM		LPM	# 特別 特別 を対している。 では、これでは、 では、 では、 では、 では、 では、 では、 では、 では、 では、	2	0
2 Misc. Sinks	KITCHEN SINK	13.2	NO RETROFIT	13.2	365	~	0
ECO2 TOTAL:		LPF		LPF	#FL/YR		0
3	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	7300	2	
Water Closets							
FCO3 TOTAL		1 PF		LPF	#FL/YR	2	0
4 Urinals							
ECO4 TOTAL:		LPM		LPM	HRS/YR	0	0
5 Shower Heads	RESIDENTIAL TYPE	9.5	NO RETROFIT	9.5	245	-	0
ECO5 TOTAL:		TEMP		TEMP		1	0
9	? CABACITY: 2	737	PENILICE STORAGE TEMP	322	8760	-	
Heater	RECOVERY: ?		INSTALL INSUL JACKET	322	8760	-	
(GAS)							
ECO6 TOTAL:						-	0
					1		

FACILITY NO.:         Water Rate:         0.42         \$/K/VH         Energy Rate:         \$/K/VH           5661 A         Gas Rate:         10.51         \$/MVH         Demand Rate:         \$/K/VH           ECO Number         Annual Water         Annual Energy Saving         WATER         Total         Total           ECO Type         Saving LPY         KWH         MWH         Dollar Saving         Dollar Saving         Dollar Saving         Dollar Saving         Dollar Saving         Total           ECO TYPE         Saving LPY         KWH         MWH         Dollar Saving         Dollar Saving         Dollar Saving         Dollar Saving         \$0.00           ECO TYPE         Saving LPY         KWH         MWH         Dollar Saving         Dollar Saving         \$0.00	Mater Rate:   0.42   \$/KL   Energy Rate:   \$/KW			3	<b>ALCULAT</b>	ION WOL	CALCULATION WORK SHEET 2		
Gas Rate:         10.51         \$\text{MWMH}\$         Demand Rate:         Total         \$\text{KW}\$           Saving LPY         KW         KWH         MWH         Dollar Saving         WATER         Total           Iss         0         0         0         \$0.00         \$0.00         \$0.00           Iss         0         \$0.00 <t< th=""><th>  Cas Rate: 10.51 \$/MWH     Saving LPY KW KWH     O</th><th></th><th>ater Rate:</th><th>0.42</th><th>\$/KL</th><th></th><th>Energy Rate:</th><th></th><th>\$/KWH</th></t<>	Cas Rate: 10.51 \$/MWH     Saving LPY KW KWH     O		ater Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
Saving LPY   KWH   MWH   Dollar Saving   NATER   Total   Total   ELEC   ELEC   GAS   S0.00   \$0.00	Saving LPY KW KWH   CELEC   ELEC		as Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
ks         ELEC         ELEC         GAS         Dollar Saving         Dollar Saving         Dollar Saving         Dollar Saving         Dollar Saving         Dollar Saving         P. C. O.         Sc. 0.00         Sc. 0.00 </th <th>  Saving LPY KW KWH KWH   Consumer Constraint of the constraint of</th> <th></th> <th>Innual Water</th> <th>Annual</th> <th>Energy</th> <th>Saving</th> <th>WATER</th> <th>Total</th> <th>Total</th>	Saving LPY KW KWH KWH   Consumer Constraint of the constraint of		Innual Water	Annual	Energy	Saving	WATER	Total	Total
Ke	ks	┝			ELEC	GAS	Dollar Saving	Dollar Saving	Dollars Invested
Ke	ks					0	\$0.00	\$0.00	\$0.00
0         0         \$0.00         \$0.00           s         \$0.00         \$0.00         \$0.00           d         \$0.00         \$0.00         \$0.00	o 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	avatory Sinks	0			0	\$0.00	\$0.00	\$0.00
s         0         0         \$0.00         \$0.00           s         0         \$0.00         \$0.00         \$0.00           s         0         \$0.00         \$0.00         \$0.00           s         0         0         \$0.00         \$0.00           s         0         0         \$0.00         \$0.00           s         0         \$0.00         \$0.00         \$0.00           s         0         \$0.00         \$0.00         \$0.00           d         \$0         \$0.00         \$0.00         \$0.00           d         \$0         \$0.00         \$0.00         \$0.00           d         \$0.00         \$0.00         \$0.00           d	s 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0			0	\$0.00	\$0.00	\$0.00
(s)         0         \$0.00         \$0.00           (s)         0         \$0.00         \$0.00           (s)         0         \$0.00         \$0.00           (s)         0         \$0.00         \$0.00           (s)         (s)         \$0.00         \$0.00 <t< td=""><td>ss 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>O1 TOTAL:</td><td>0</td><td>0</td><td>0</td><td>0</td><td>\$0.00</td><td>\$0.00</td><td>\$0.00</td></t<>	ss 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	O1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
ss         0         \$0.00         \$0.00           c         0         \$0.00         \$0.00           c         0         \$0.00         \$0.00           ets         0         0         \$0.00         \$0.00           ets         0         \$0.00         \$0.00         \$0.00           ets         \$0.00	ss 0 0 0 0 188,340 0 ets 0 188,340 0 188,340 0 0 0 0 0 0 0 0 0 0 0 0 0 EST ANNUAL OCONSUMPTION (LITERS) 43,946 0 0	2	0			0	\$0.00	\$0.00	\$0.00
0	ets 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
188,340         \$0.00         \$0.00         \$0.00           ets         0         \$78.16         \$78.16           0         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           est and the control of t	ets 0 0 0 0  188,340  188,340  188,340  0 0  0 0  0 0  0 0  EST ANNUAL HOT WTR CONSUMPTION (LITERS) 43,946  S CORP		0			0	\$0.00	\$0.00	\$0.00
ets         188,340         \$78.16         \$78.16           ets         0         \$0.00         \$0.00           :         0         \$0.00         \$0.00           :         0         \$0.00         \$0.00           :         0         \$0.00         \$0.00           :         0         \$0.00         \$0.00           :         0         \$0.00         \$0.00           ads         0         \$0.00         \$0.00           :         0         \$0.00         \$0.00           :         \$0.00         \$0.00         \$0.00           :         \$0.00         \$0.00         \$0.00           :         \$0.00         \$0.00         \$0.00           :         \$0.00         \$0.00         \$0.00           :         \$0.00         \$0.00         \$0.00           :         \$0.00         \$0.00         \$0.00           :         \$0.00         \$0.00         \$0.00           :         \$0.00         \$0.00         \$0.00           :         \$0.00         \$0.00         \$0.00           :         \$0.00         \$0.00         \$0.00           :	ets 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	302 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
ets         0         \$0.00         \$0.00           188,340         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           ads         0         \$0.00         \$0.00           ads         0         \$0.00         \$0.00           ads         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WTR         0.89         \$0.00         \$0.00           (LITERS)         7.70         \$0.00         \$0.00           43,946         0         9         \$0.00           43,946         0         9         \$0.00	ets 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3	188,340				\$78.16	\$78.16	\$838.80
0         \$0.00         \$0.00           188,340         \$78.16         \$78.16           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           3ds         0         \$0.00         \$0.00           ads         0         0         \$0.00           1         0         \$0.00         \$0.00           2         0         \$0.00         \$0.00           3         0         \$0.00         \$0.00           4         0         \$0.00         \$0.00           5         \$0.00         \$0.00           5         \$0.00         \$0.00           5         \$0.00         \$0.00           6         \$0.00         \$0.00           6         \$0.00         \$0.00           6         \$0.00         \$0.00           6         \$0.00         \$0.00           6         \$0.00         \$0.00           8         \$0.00         \$0.00           8         \$0.00         \$0.00           8         \$0.00         \$0.00           8         \$0.00         \$0.00	188,340 0 0 0 0 0 0 0 0 0 0 EST ANNUAL HOT WTR CONSUMPTION (LITERS) 43,946 SCORP	Water Closets	0				\$0.00	\$0.00	\$0.00
:         188,340         \$78.16         \$78.16           0         0         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           :         0         \$0.00         \$0.00           ads         0         0         \$0.00           i         0         \$0.00         \$0.00           :         0         \$0.00         \$0.00           :         EST ANNUAL         0         \$0.00         \$0.00           HOT WIR         0         \$0.00         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96         \$0.37           43,946         0         9         \$0.00         \$0.33	: 188,340 0 0 0 0 0 0 0 0 0 : 0 0 : 0 HOT WTR CONSUMPTION (LITERS) 43,946 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0				\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WTR         0.89         \$0.00         \$0.00           CONSUMPTION         7.70         \$0.00         \$0.96           43,946         0         9         \$0.00         \$0.33	0 0 0 0 0 0 0 0 ANNUAL 5T WTR SUMPTION ITERS) 3,946 0 0	CO3 TOTAL:	188,340				\$78.16	\$78.16	\$838.80
0         \$0.00         \$0.00           0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           do         0         \$0.00         \$0.00           EST ANNUAL         0         \$0.00         \$0.00           HOT WTR         0.89         \$0.00         \$0.00           CONSUMPTION         7.70         \$80.96           LITERS)         7.70         \$80.96           43,946         0         9         \$0.00         \$90.33	0 0 0 0 0 0 0 ANNUAL 5T WTR SUMPTION ITERS) 3,946 0 0	4	0				\$0.00	\$0.00	\$0.00
0         \$0.00         \$0.00         \$0.00           0         \$0.00         \$0.00         \$0.00           ds         0         \$0.00         \$0.00         \$0.00           est annual         0         \$0.00         \$0.00         \$0.00           HOT WIR         0.89         \$0.00         \$0.37           CONSUMPTION         7.70         \$80.96           (LITERS)         7.70         \$80.96           43,946         0         9         \$0.00         \$90.33	0 0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	Urinals	0				\$0.00	\$0.00	\$0.00
ds         0         \$0.00         \$0.00           ds         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           0         0         \$0.00         \$0.00           EST ANNUAL         0         0         \$0.00         \$0.00           HOT WTR         0.89         \$0.00         \$0.37         \$0.00           CONSUMPTION         7.70         \$80.96         \$0.00         \$0.00           43,946         0         0         \$0.00         \$0.00         \$0.33	0 0 0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0		0				\$0.00	\$0.00	\$0.00
5         0         \$0.00         \$0.00           ver Heads         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           Water         HOT WITR         0.89         \$0.00         \$0.37           Heater         CONSUMPTION         7.70         \$80.96           (GAS)         (LITERS)         7.70         \$80.96           43,946         0         9         \$0.00         \$90.33	0 0 0 0 ANNUAL 5T WTR SUMPTION ITERS) 3,946 3,946 0 0	304 TOTAL:	0				\$0.00	\$0.00	\$0.00
wer Heads         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           TOTAL:         0         0         \$0.00         \$0.00           EST ANNUAL         0         0         \$0.00         \$0.00           Water         HOT WTR         0.89         \$9.37         1.70           Heater         CONSUMPTION         7.70         \$80.96         1.70           (GAS)         (LITERS)         2.70         \$80.96         1.70           A3,946         0         9         \$0.00         \$90.33	0 0 0 ANNUAL OT WTR SUMPTION ITERS) 3,946 0 0	5	0			0	\$0.00	\$0.00	\$0.00
TOTAL:         0         \$0.00         \$0.00           6         EST ANNUAL         0         0         \$0.00           Water         HOT WTR         0.89         \$9.37           Heater         CONSUMPTION         7.70         \$80.96           (GAS)         LITERS)         43,946         0         9         \$0.00         \$90.33	0 0 0 ANNUAL 0 0 0 SUMPTION ITERS) 3,946 0 0	Shower Heads	0			0	\$0.00	\$0.00	\$0.00
TOTAL:         0         0         \$0.00         \$0.00           6         EST ANNUAL         0.89         \$9.37           Water         HOT WTR         7.70         \$80.96           Heater         CONSUMPTION         7.70         \$80.96           (GAS)         (LITERS)         43,946         9         \$0.00         \$90.33           TOTAL:         43,946         0         9         \$0.00         \$90.33	0 0 0 ANNUAL ST WTR SUMPTION ITERS) 3,946 0 0		0			0	\$0.00	\$0.00	\$0.00
EST ANNUAL         0.89         \$9.37           HOT WTR         7.70         \$80.96           CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         9         \$0.00         \$90.33	ANNUAL  OT WTR  SUMPTION ITERS) 3,946 0 0	TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
HOLIWIR 10.89 \$9.37 CONSUMPTION 7.70 \$80.96 (LITERS) \$43,946 0 0 9 \$0.00 \$90.33	3,946 0 0		EST ANNUAL			000		1000	
CONSUMPTION         7.70         \$80.96           (LITERS)         43,946         0         9         \$0.00         \$90.33	3,946 0 0		HO! WIK			0.89		\$9.37	
(LITERS) 43,946 43,946 0 0 9 \$0.00 \$90.33	3,946 3,946 0 0		ONSUMPTION			7.70		\$80.96	\$60.00
43,946 0 9 \$0.00 \$90.33	3,946 0 0	(GAS)	(LITERS)						
43,946 0 0 9 \$0.00 \$90.33	3,946 0 0		43,940						
		SOG TOTAL:	43,946	0	0	6	\$0.00	\$90.33	\$60.00

Systems Engineering and Management Corporation, Knoxville, TN

ON AET HOVE	CALCI	SULAT	ULATION WORK SHEET 1			DATE:	5 OCT 94
FACILITY NO.:	5672 A		FUNCTION:		UNACCOM PERS HOUS	W PERS	HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:	1	24 24		CINIC
ECO Number	<b>Existing Fixture System</b>	1 1	Retrofited Fixture System	1 1	Usage	Fixtures	Water Leaks
ECO Type	Description	5		LPM	HRS/YR	Quantity	Eliminated LPY
Lavatory Sinks	W AERATOR	G. 0.	ואס אפואסרוו	G. 0.	671		
- LOTAL .		MO		20		*	c
T	KITCHEN SINK		NO RETROFIT	9.5	365	-	0
Misc. Sinks							
ECO2 TOTAL:	79-	LPF		LPF	#FL/YR	-	0
Γ	TANK TYPE	19	1.6 GPF TANK TYPE TOILET	6.1	14600	-	
Water Closets							
FCO3 TOTAL .		- DE	1 (2) (2) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	100	#EI WB	4	c
4		-					
Urinals							
ECO4 TOTAL:		LPM	Service of the servic	LPM	HRS/YR	0	0
	RESIDENTIAL TYPE	1-	NO RETROFIT	9.5	245	1	0
Shower Heads							
ECO5 TOTAL:		TEMP		TEMP		1	0
<b>6</b> 40 G/	40 GAL RHEEM IMPERIAL						
Water CAPA	CAPACITY: ?	334	REDUCE STORAGE TEMP	322	8760	1	
	RECOVERY: ?		INSTALL INSUL JACKET	322	8760	1	
(GAS)							
ECO6 TOTAL:				±-1.		1	0

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT. KNOX WATER CON	T. KNO	X WATE	ER CON	<b>RVATION STUDY</b>	TUDY	2 OF 2
		Ç	LCULAT	IOM MOI	윘		
FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
Z 7 200	Gas Rate:	10.51	\$/WWH		Demand Rate:		\$/KW
ECO Number	Annual Water	Annual	Energy 8	Saving	WATER	Total	Total
ECO Type	Saving LPY	ELEC	ELEC KWH	GAS MWH	Dollar Saving	Dollar Saving	Dollars Invested
-	0			0	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
3	188,340				\$78.16	\$78.16	\$418.80
Water Closets	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$418.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
9	EST ANNUAL						
Water	HOT WTR			0.89		\$9.37	
Heater	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS)						
	43,946						
ECO6 TOTAL:	43,946	0	0	6	\$0.00	\$90.33	\$60.00

Systems Engineering and Management Corporation, Knoxville, TN

	FY94S EEAP FT	T. KNOX WAT	WAT CONSERVATION STUDY	S NOI	TUDY		10
	CAL	CULATION	CALCULATION WORK SHEET 1			DATE:	5 OCT 94
FACILITY NO.:	9053 B		FUNCTION:	— <sub>I</sub> I	UNACCOM PERS	A PERS	HOUS DET FAC
Occupancy:	FAMILY		Operating Hours:	1	1 Y PICAL OF 327 UNITS	JF 327 U	SINC
ECO Number	Existing Fixture System		Retrofited Fixture System	_	Usage	Fixtures	Water Leaks
ECO Type	_	LPM	Description	LPM	<b>HRS/YR</b>	Quantity	Eliminated LPY
-	SINK W/ AERATOR	9.5 NO F	RETROFIT	9.5	125	2	
Lavatory Sinks							
ECO1 TOTAL:		Md I		PM		2	c
2	KITCHEN SINK	1	NO RETROFIT	9.5	365	1	0
Misc. Sinks							
ECO2 TOTAL:		Jd7	を 1 日本の 1	LPF	#FL/YR	-	0
က	TANK TYPE	<del> </del>	1.6 GPF TANK TYPE TOILET	6.1	7300	.2	
Water Closets		111					
ECO3 TOTAL:		LPF		LPF	#FL/YR	2	0
4							
Urinals							
ECO4 TOTAL:		LPM		LPM	HRS/YR	0	0
2	RESIDENTIAL TYPE	1-	NO RETROFIT		245	_	55640
Shower Heads							
ECO5 TOTAL:		TEMP		TEMP		1	55640
9	40 GAL RUUD #P40-7						
Water	CAPACITY: ?	345 RED	REDUCE STORAGE TEMP	322	8760	_	
Heater	RECOVERY: ?	INST	INSTALL INSUL JACKET	322	8760	-	
(GAS)							
ECOR TOTAL .				S. S		,	
- COO 1019F		S. Carlos and S. Carlos				-	
F							
CVCTEMS CODD				•			144 - 11.
	L	Systems E	Systems Engineering and management Corporation,	nent Co	rporation		Knoxville, IN
-25							

	FY94S EEAP FT. KNOX	FT. KNC		WATER CON	RVATION STUDY	TUDY	2 OF 2
		Ö	CALCULAT	TION WO	ا≍ا		
FACILITY NO.:	Water Rate:	0.42	\$/KL		Energy Rate:		\$/KWH
	Gas Rate:	10.51	\$/MWH		Demand Rate:		\$/KW
ECO Number	Annual Water	Annual	1-	Saving	WATER	Total	Total
ECO Type	Saving	ELEC	ELEC	GAS	Dollar Saving	Dollar Saving	Dollars Invested
1				0	\$0.00	\$0.00	\$0.00
Lavatory Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO1 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
2	0			0	\$0.00	\$0.00	\$0.00
Misc. Sinks	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO2 TOTAL:	0	0	0	0	\$0.00	\$0.00	\$0.00
3	188,340				\$78.16	\$78.16	\$838.80
Water Closets	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO3 TOTAL:	188,340				\$78.16	\$78.16	\$838.80
4	0				\$0.00	\$0.00	\$0.00
Urinals	0				\$0.00	\$0.00	\$0.00
	0				\$0.00	\$0.00	\$0.00
ECO4 TOTAL:	0				\$0.00	\$0.00	\$0.00
5	55,640			96	\$23.09	\$1,034.18	\$0.00
Shower Heads	0			0	\$0.00	\$0.00	\$0.00
	0			0	\$0.00	\$0.00	\$0.00
ECO5 TOTAL:	55,640	0	0	96	\$23.09	\$1,034.18	\$0.00
9	EST ANNUAL						
Water	HOT WTR			1.75		\$18.35	
Heater	CONSUMPTION			7.70		\$80.96	\$60.00
(GAS)	(LITERS)						
	43,946						
ECO6 TOTAL:	43,946	0	0	6	\$0.00	\$99.31	\$60.00
SVSTEMS CORP	GAO			Svefeme	Engineering an	Management Cor	Systems Engineering and Management Corneration Knovville TN
) ) [ ] ]				gyarems	rigineening and	u Manayement oor	polation, mioaviie, in